
POLYCHÆTOUS ANNELIDS OF THE HAWAIIAN ISLANDS
COLLECTED BY THE STEAMER ALBATROSS IN 1902.

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INTRODUCTION.

The polychætous annelids here described were collected by the U. S. Fish Commission steamer *Albatross*, in 1902, in the vicinity of the Hawaiian Islands. In addition, a single specimen (*Terebella* sp.) from Pago-Pago, Samoa, and a number of specimens collected in 1903 off the coast of California are described in this report. The families represented and the number of new and old species found in each are as shown in the accompanying table:

Family.	Old species.	New species.	Family.	Old species.	New species.
Amphinomidæ	5	1	Staurocephalidæ	1	.....
Aphroditidæ	2	.....	Eunicidæ	6(+1?)	8
Polynoidæ	6	5	Goniadidæ .....	.....	1
Acœtidæ .....	.....	1	Glyceridæ	1	.....
Sigallonidæ	2	.....	Cirratulidæ	2	.....
Nephtydidæ	1(?)	.....	Maldanidæ	1(?)	.....
Phyllodocidæ	3	.....	Hermellidæ	1	1
Alciopidæ	2	2	Terebellidæ	4(+3?)	4
Hesionidæ	1	1	Sabellidæ	1	3
Syllidæ	2	.....	Serpulidæ	2(+1?)	.....
Nereidæ	3	.....	Tomopteridæ	1(?)	.....

Much of this material was very badly preserved, and it was often difficult to get normal structures for study. It is probable, therefore, that some species here described as new may belong really to previously known species. My chief endeavor has been to describe them with clearness, so that they may be recognized if they appear in later collections.

Family SYLLIDÆ.

Genus *TRYPANOSYLLIS*.

Trypanosyllis gemmipara (P) Johnson.

Trypanosyllis gemmipara Johnson, The Polychæta of the Puget Sound Region, Proc. Boston Soc. Nat. Hist., vol. 29, no. 18, p. 405, pl. 7, figs. 72 to 76.

Fragments of three specimens, probably of this species. Setæ have rather longer terminal joints than in Johnson's description, and the esophagus is shorter. Esophagus with 8 rather than 10 teeth.

Collected at station 4070, 45 to 52 fathoms, on a bottom of fine gray sand, and from station 4551, in the vicinity of Monterey Bay, Cal.

Genus *EUSYLLIS* Malmgren.*Eusyllis tubifex* Gosse.

Fragments of specimens agreeing with McIntosh's description of this species (McIntosh, Challenger Report, vol. XII, p. 190).

Collected at station 4551, vicinity of Monterey Bay, Cal.

Family HESIONIDÆ.

Genus *CASTALIA* Sars.*Castalia oculata*, new species.

Head roughly 4-sided, broader end in front. A pigmented depression in anterior median area (fig. 1). Eyes, two pairs, anterior ones very large, distinctly bilobed, the larger lobe anterior; posterior eyes less prominent, oval.

Tentacles about as long as head, slender, tapering; palps with broad basal and slender terminal joints, about two-thirds as long as head. In the specimen figured they were curved down over the pharynx, and thus appear shorter. Proboscis when protuded (fig. 1, *p.*), with a median dorsal lobe lying just in front of the prostomium (fig. 1, *m. l.*).

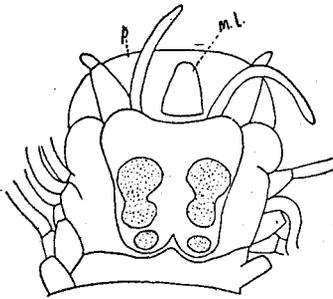


FIG. 1.

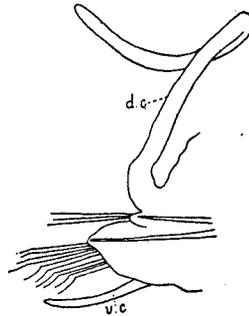


FIG. 2.



FIG. 3.

Castalia oculata, new species. (1) Head, $\times 7$; *m. l.*, median lobe; *p.*, proboscis. (2) Parapodium, $\times 7$; *d. c.*, dorsal cirrus; *v. c.*, ventral cirrus. (3) Compound seta, $\times 183$.

Median portion of head with edges rounded. On either side from base of this rounding the surface slopes downward and outward to bases of tentacular cirri. These are 8 on a side, approximately equal in size.

Somites, 17, with dorsal and ventral cirri, but the seventeenth without setæ; dorsal cirrus long, with surface more or less regularly ringed, but apparently not a true jointing; ventral cirrus extending considerably beyond end of parapodium.

Parapodium with large ventral and small dorsal lobe (fig. 2). Setæ of former large, compound, with teeth at apex of terminal portion, and a row of minute denticulations along edge of latter (fig. 3). Basal portion with fine longitudinal lines running along it in an elongated spiral fashion; numerous transverse lines intersect these, dividing the surface into small quadrangular spaces; dorsal setæ very long, slender, and sharp-pointed, with numerous parallel transverse lines throughout their greater portion.

Length, 15 mm.; width, without parapodia, 5 mm. Collected at station 4066, 176 to 49 fathoms, on a rocky bottom.

Type no. 5200, U. S. National Museum.

Genus *HESIONE* Savigny.*Hesione pacifica* McIntosh.

Hesione pacifica McIntosh, Report Challenger Expedition, vol. XII, p. 184, pl. XXIX, fig. 2, pl. XXXII, fig. 14.

McIntosh records that the tips of all setæ were broken in his specimens. Mine showed complete compound setæ (fig. 4). A noticeable feature is a reddish brown transverse band on the 2d setigerous somite.

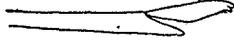


FIG. 4.—Compound seta of *Hesione pacifica*, $\times 183$.

Collected at stations 3969, 15 to 16 fathoms, on a bottom of coarse sand, of shell, and coral; 3876, 28 to 43 fathoms, on sandy bottom; 4061, 24 to 83 fathoms, on coral, sand, and coralline nodules; and 4168, 20 to 21 fathoms, on coral, sand, and foraminifera.

Family POLYNOIDÆ.

Genus *POLYNOE* Savigny.*Polynoe magnipalpa?* McIntosh.

Polynoe magnipalpa McIntosh, Report Challenger Exp., vol. XII, p. 118, pl. XII, fig. 6, pl. XIV, figs. 1, 6, pl. XVIII, fig. 5, pl. X A, figs. 5, 6.

A single specimen, probably of this species. The lateral tentacles were relatively larger, and the palps smaller than in McIntosh's specimen. He describes clavate papillæ on border of elytron. These are not shown in his drawing, and do not appear in the Hawaiian specimen.

Collected at station 3968, $14\frac{1}{2}$ to $16\frac{1}{2}$ fathoms, on bottom of coarse stone and coral.

Polynoe mirabilis McIntosh.

Polynoe mirabilis McIntosh, Report Challenger Exp., vol. XII, p. 121, pl. XVI, fig. 1, pl. XII A, figs. 9 to 11.
Oligolepis violacea Levensen, Kara Havets, Copenhagen, 1886, p. 290, pl. 25.

McIntosh states that the "pedicels of nine pairs of scales exist in the specimen," and that "traces of two pairs of cirri occur on each side of the anus," thus implying that his specimens were entire. Of the Hawaiian specimens, none was entire; one had 25, and others 28 elythrophones on a side, with a total number of somites of over 70. In a personal communication Professor McIntosh tells me that while his description was correct as applied to his single, imperfect specimen, the form described by Levensen is undoubtedly the same, and is described as having 25 bristle-bearing feet. In view of the similarities between these and McIntosh's description I am certain that they all belong to his species, and that the apparent lack of agreement in number of somites is due to the fact that none was complete.

McIntosh describes a filiform process on the inner anterior border of the head lobe, which he thinks may be the homologue of the antenna. Some of the Hawaiian specimens showed a similar process, but others had a slender tentacle a trifle longer than the head, and, like the cirri, with a slight swelling just behind the pointed apex. The "filiform process" is evidently merely a remnant of the antenna, of which the greater portion has broken away.

No elytra were present. Largest specimen 80 mm. long, 15 mm. wide, exclusive of parapodia. Width to tip of parapodium, 30 mm.

On the locality label was noted, "livid flesh pink or light beef pink."

Collected at stations 4028, 444 to 478 fathoms, on gray sand and globigerina ooze; 4022, 399 to 374 fathoms; 4113, 433 to 395 fathoms; and 4014, 399 to 362 fathoms, the three latter on coral, sand, and foraminifera.

Polynoe alba, new species.

Each lateral half of head pear shaped, with anterior portion prolonged to form base for tentacles (fig. 5); median tentacle filling entire space between laterals; whole head white, looking as if incrustated with a calcareous deposit, this much denser on bases of tentacles; all tentacles, except basal joints,

and tentacular cirri, lost on specimens; palps long, smooth, gently tapering to apex; proboscis 10 times as long as head, with 13 papillæ above and below; two strong, dark brown teeth above and below, with lighter colored plates on either side; dorsal surface flesh color, prominently marked with the white incrustation-like color found on the head. This is especially noticeable on parapodia, but is continued anteriorly, more or less irregularly across the entire surface. Behind about somite 14, elytra-bearing somites are free from white pigment, while somites between (those having a dorsal cirrus) are marked across the entire back by this white pigment, giving the middle of the body a very characteristic striated appearance.

Only a single elytron remained in either of the two specimens. This, the most anterior on the left side, was ovate, with outer edge rather narrow and of a dense white color; center of elytron with a number of white patches; rest of elytron transparent, edge entire. The elytron blends so well with the color of the rest of the body that it is not easy to see.

Most dorsal cirri had been lost; those remaining were slender, conical, extending only a short distance beyond end of parapodium. Ventral cirrus short, conical, situated about at middle of parapodium. Parapodium short as compared with body diameter, with apex divided into anterior and posterior rounded lobes (fig. 6). Setæ all of one kind, simple, apex flattened and slightly bent, and bearing on concave surface, two rows of very delicate plates looking, under low power, like two series

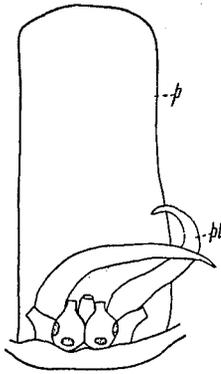


FIG. 5.

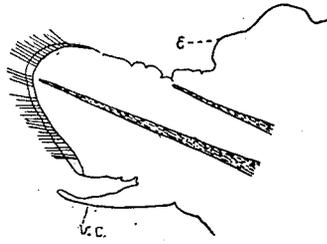


FIG. 6.



FIG. 7.

Polynoe alba, new species. (5) Head, $\times 5$; p., proboscis; pl., palp. (6) Parapodium, $\times 12$; e, elytrephore; v. c., ventral cirrus. (7) Seta, $\times 57$.

of sharp spines. Each plate has a narrow base and broader distal portion, the latter cut into minute teeth; whole plate curved, with concave surface next to shaft of seta (fig. 7, from side).

Head 1 mm. in diameter; somite 2-4 mm. in diameter. One somite from the middle of the body measures about 6 mm.

Collected at Honolulu Reefs. Type (no. 5201, U. S. National Museum) an incomplete specimen; head 1 mm. broad; somite 2-4 mm. broad; a somite from near middle of body about 6 mm. broad.

Polynoe lucida, new species.

Head rather broader than long, markedly iridescent (in alcohol) with two pairs of eyes, anterior rather larger than posterior (fig. 8); lateral lobes of head prolonged into bases of attachment for lateral tentacles; lateral tentacle 5 or 6 times as long as head, with acute tip, and subterminal swelling; median tentacle with broad base, filling space between bases of lateral; like lateral in form, but longer and a little stouter; base of each tentacle tipped with brown, the median having the deeper color. Palps had been broken off; a loose one in the bottle, undoubtedly belonging to this specimen, was broad at base, tapering gently to an acute tip.

Elytrephores on somites 2, 4, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 26, 29, 32, 35, etc. Only about 50 somites present, and elytra were absent from most of these; where present they cover nearly the whole dorsal surface. Except for pigment patches, elytra very transparent, body wall showing clearly

through them. Elytron from middle of body broadly ovate, with entire edge (fig. 9); point of attachment to elytophore visible from above as a colorless area. This nearly or quite surrounded by a band of dark brown pigment, from which a band of pigment extends to the edge of the elytron which lies on the mid-dorsal line. This pigmented area varies in width from a narrow band to a broad patch, from whose anterior end scattered pigment spots may extend; posterior edge more sharply defined, convex. A median longitudinal brown line along the dorsal surface of the body, this more prominent posteriorly. Parapodia long, posterior ones longer than transverse diameter of body; at the outer dorsal angle each is prolonged into equal anterior and posterior ear-like processes, between which setæ emerge (fig. 10). A large aciculum extends into main lobe, with a smaller one going toward dorsal surface.

Setæ all of one kind, long, simple, terminal portion slightly enlarged and bent. On convex surface of bent portion are two rows of very delicate thin plates, more or less alternating with one another; under low power these look like two rows of spines; under higher power each "spine" is seen to be a very thin plate, broader at its distal than at its proximal attached end. Owing to their transparency the precise form of these plates is difficult to determine. Their general form is very like setæ of *Polynoe alba*.

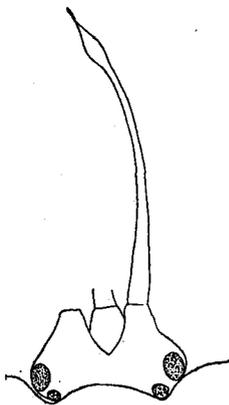


FIG. 8.

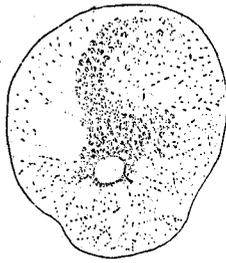


FIG. 9.

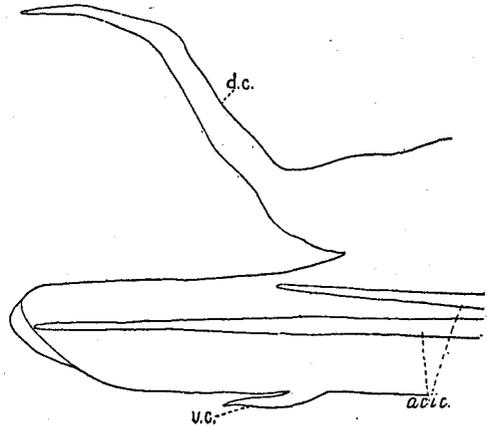


FIG. 10.

Polynoe lucida, new species. (8) Head, $\times 9$. (9) Elytron, $\times 12$. (10) Parapodium, $\times 12$; v. c., ventral cirrus; d. c. dorsal cirrus; acic., aciculae.

Collected at station 4062, 83 to 113 fathoms, on a bottom of corals, volcanic sand, and shells.

Type (no. 5202, U. S. National Museum) an incomplete specimen of 60 somites; length, 37 mm.; width of head, 1.5 mm.; width of body at somite 6 with parapodia, 7.5 mm., without parapodia, 4.5 mm.

Polynoe spicula, new species.

Head oval, width at base of ceratophores about equal to that of posterior edge; greatest length about equal to greatest width, prolonged anteriorly on either side into bases of ceratophores, the latter deep brown with colorless apex; antennæ slender, length to extreme tip about equal to that of head and ceratophore. At about two-thirds of distance from base to tip there is a slight enlargement, beyond this the organ tapers rapidly to a very delicate tip; basal half brown in color, with a brown band at base of swelling; remainder white. Ceratophore of medium antenna completely filling space between those of lateral ones, extending only to a short distance beyond them and colored like them; terminal portion like that of lateral antenna, but a trifle larger; eyes two pairs, the anterior slightly the larger, and situated on the lateral surface of head; posterior pair near posterior border, and slightly nearer median line than anterior; palps extending about as far as median antenna, gently tapering, abruptly narrowing to apical portion, which is slender and nearly uniform in diameter throughout; tentacular cirri like antennæ in form and color.

Elytra 12 pairs; first ovate in outline, anterior and lateral margins with a relatively very broad fringe of cylindrical processes, other margins smooth. Surface of elytron divided into angular areas of various sizes, the largest nearest the middle. These are indicated by their brown color, the lines between being colorless. From the center of each arises a hard, dark-brown spine. Toward the fringed border these spines are relatively short, the ends of some showing subdivisions into 3 or 4 points. Largest spines 10 to 14 in number, on large central and dorsal areas. These in height may be very nearly equal to width of area. Other elytra more nearly reniform, those of same side overlapping,



FIG. 11.—Seta of *Polynoë spicula*, $\times 280$.

while those of opposite sides overlap for more than one-fourth of their length; concealed portion white, remainder brown, due to brown areas mentioned above. Two or three posterior pairs of elytra especially noticeable for the size of the dorsal spines.

Most dorsal cirri had been lost; those which remained were like tentacles in form and color; ventral cirrus acutely conical, with slender terminal prolongation reaching about to end of parapodium. Parapodium cylindrical, obliquely truncated at apex, with posterior and anterior edges prolonged into flat vertical lobes, the former slightly the longer of the two. Two large dark-brown aciculæ protrude slightly beyond apex of parapodium.

Ventrally there is a tuft of about 20 very long setæ with broad basal portions; apex slightly narrowed and tapering to terminal hook. Beginning about three-fourths of length of free portion of seta is a double row of fine lateral teeth (fig. 11 from side, showing one row), each with a narrow base and a flattened apex, these teeth increasing in size toward end of seta, and the row terminated by a single stout tooth, showing no secondary denticulations. Stalk of seta with prominent longitudinal striations extending as far as large terminal tooth. Dorsally a bundle about equal in number to those of ventral bundle, of much shorter, more translucent setæ, which taper uniformly to their apex, and show on either side a close-set row of minute plates each with narrow base, and broad, finely toothed apex. These overlap one another from base of seta toward apex, and show very little, if any, decrease in size toward apex of seta.

Collected at station 4420 and from station 4551, vicinity of Monterey Bay, Cal.

Type (no. 5203, U. S. National Museum) a specimen 18 to 20 mm. long and 5.5 mm. in width, from station 4551.

Polynoë mutilata, new species.

Head rounded, with a trace of a single anterior lateral eye remaining; median tentacle very slender; antennæ slender, tapering, about twice as long as head, marked with an irregular black patch near the base; tentacular cirri in form much like antennæ and marked with similar black patch, the cirri varying in size, smallest about twice size of antenna, largest twice the size of smallest; palps long, smooth, gently tapering to a blunt point.

Elytra very small and inconspicuous, anteriorly not covering dorsal surface of parapodium. Posteriorly they cover parapodia, but leave whole median area of body uncovered. Elytra thin, nearly circular in outline, with edge entire and no noticeable surface markings. Whole body as well as elytra pale yellow in color, so that elytra are not prominent.

Anterior parapodia, e. g. second, shows a very delicate aciculum in the notopodial region, and a very stout one in the neuropodial. From the notopodial region protrudes a tuft of very long, fine,



FIG. 12.

FIG. 13.

FIG. 14.

FIG. 15.

Polynoë mutilata, new species. (12 and 13) Anterior seta, $\times 188$.
(14 and 15) Posterior seta, $\times 188$.

thread-like setæ. At dorsal and ventral angles of neuropodium is a tuft of long setæ with slender bases, their terminal portion slightly flattened, at first broader than the base, tapering gently to the long, acutely pointed, wavy, terminal portion. A double row of teeth, looking in profile like a single row of denticulations (fig. 12), in face showing as a row on either side. Dorsally only a few of these (2 in specimen drawn), ventrally 10-12.

Between the two bundles of finer setæ was a single row of a few large setæ, prominent on account of their size and brownish-yellow color. Each has a broad base (fig. 13), slightly widening and then rapidly tapering to the apex, which is bluntly rounded and provided with a tuft of stiff hair-like bristles at the end. Indefinite and poorly defined longitudinal and transverse markings appear on the surface of these setæ. Ventral cirrus rather stout, gently tapering to blunt end.

Parapodium of 16th-somite shows ventrally a tuft of setæ like figure 13 and dorsally a smaller tuft of setæ like figure 14. Here the terminal portion has the appearance of having been teased out into fine fibrils. Through median portion of parapodium a single row of very stout setæ (fig. 15). At the apex each is prolonged into a long spine, which bears near its base a row of shorter spines. On one side edge of seta apex seems to be entire, on opposite side is a shallow indentation, from bottom of which arise numerous small spines.

Apparently setæ like figure 14 appear first on somite 7. From the fact that I find only a very few setæ like figure 15 on anterior somites it is possible that those represented in figure 13 are merely mutilated specimens really belonging to this variety. I am unable, however, to discover in them any indication of the terminal depression from which the spines arise. Setæ with numerous fine processes at the ends are especially numerous on somites behind about the 20th.

Fragments of anterior ends of about half a dozen specimens, contained in thick-walled mud tubes, outer surface of latter covered with deposit of thick brown mud. None were complete, and none were well preserved.

Collected at station 3892, 328 fathoms, and from station 4027, 319 fathoms; both on a bottom of fine gray sand.

Type (no. 5204, U. S. National Museum) an incomplete specimen from station 4027; length of 28 anterior somites, 17 mm.; greatest width, including parapodia, 5 mm.; width of head, 1 mm.; length of protruded proboscis, 7 mm.

Genus **HARMOTHOE** Kinberg.

Harmothoe haliaeti McIntosh.

Harmothoe haliaeti McIntosh, Report Challenger expedition, vol. XII, p. 96; British Annelids, pt. II, Ray Society, p. 336, pl. xxxviii, fig. 27, pl. xxxix, fig. 1, 2, 3.

In the first of the above publications McIntosh gives no illustrations, and in the second figures only setæ. The other references which he quotes were not accessible to me. I have identified the specimens from the character of the setæ and from McIntosh's description of the head. (See fig. 16.)

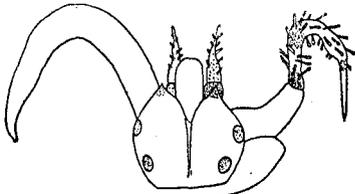


FIG. 16.



FIG. 17.

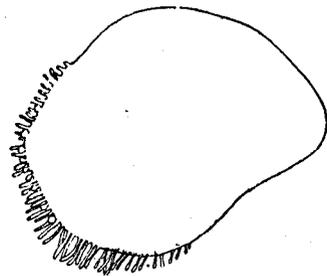


FIG. 18.

Harmothoe haliaeti. (16) Head, $\times 12$. (17) Seta, $\times 280$. (18) Elytron, $\times 28$.

In the setæ, however, it seems to me that the spiny protrusions on the sides are really rows of distinct teeth (fig. 17), and not flat plates with denticulated ends, as McIntosh figures. In the Challenger report McIntosh describes the elytra as with smooth edges. In the second paper he quotes Haswell α ,

α Polychaeta Liverpool District, p. 281, pl. xliii, fig. 2.

who describes them as having densely fimbriated borders. The specimens from Hawaii agree with the latter character (fig. 18).

Collected from station 4077, 99-106 fathoms, on fine coral sand and foraminifera, station 4098, under essentially similar conditions, and station 3972, 100-374 fathoms, on coarse sand and coral.

Harmothoe hirsuta Johnson.

Harmothoe hirsuta Johnson, Preliminary Account of the Annelids of the Pacific Coast, Proc. Cal. Ac. Sci., 3d ser., vol. 1, p. 182, pl. vi, figs. 27, 28, pl. vii, fig. 38, pl. viii, figs. 53, 53a, 53b, 53c.

A single specimen lacking all head appendages and all dorsal cirri. I have identified it as this species from the character of the head (though the anterior eyes are larger than in Johnson's figure 38), from the structure of a single elytron, which shows the characteristic branched tubercles, and from the setæ, in which respect the specimen agrees perfectly with Johnson's description.

Collected at station 4312 in the vicinity of San Diego, Cal.

Harmothoe tuberculata, new species.

Owing to the incompleteness of the single specimen in this collection, I am unable to write a very complete description, and have given the above specific name only provisionally.

All cirri, antennal elytra, and tentacles lost; 13 pairs of elytophores, on somites 1, 2, 5, 7, etc.; total length, 17 mm.; greatest breadth, 5 mm.; on median dorsal line a very prominent tubercle in each somite. Beyond the statement that antennæ are inserted below the level of tentacle, nothing can be said about the character of the head. A single tentacular cirrus shows a subterminal swelling.

Neuropodium and notopodium distinct in the parapodia. (Fig. 82.) Neuropodium rounded at apex, with anterior face covered with short finger-shaped branchiæ. Most dorsally placed branchia four times as long as the others (b, fig. 82). Neuropodial setæ few, shaft broad, abruptly widening toward apex, narrowing again rapidly to gently curved tip. Shaft marked by very fine longitudinal striations. Running transversely across both faces of terminal enlargement are a number of rows of fine, tooth-like projections continued as far as base of terminal hook.

The label reads: "Commensal in actinostome of *Brisinga*."

Type no. 5205, U. S. National Museum, 16 mm. long, collected at station 4177, on bottom of fine gray sand, in 451 fathoms.

Genus GATTYANA.

Gattyana senta Moore.

Gattyana senta Moore, Some new Polynoidæ, with a list of other Polychaeta from North Greenland waters, Proc. Phila. Acad. Nat. Sci., vol. LIV, May, 1902.

A single specimen from station 4551, in the vicinity of Monterey Bay, California. The specimen was incomplete, of only 25 somites, and measured 25 mm. The only point of difference between it and Moore's description was that nephridial papillæ begin on sixth instead of ninth somite.

Genus IPHIONE Savigny.

Iphione muricata (Savigny).

Polymoe muricata Savigny, Systeme des Annelides, p. 21, pl. II, fig. 1, 1809.

Iphione muricata Grube, Annulata Semperiana, p. 21, 1818.

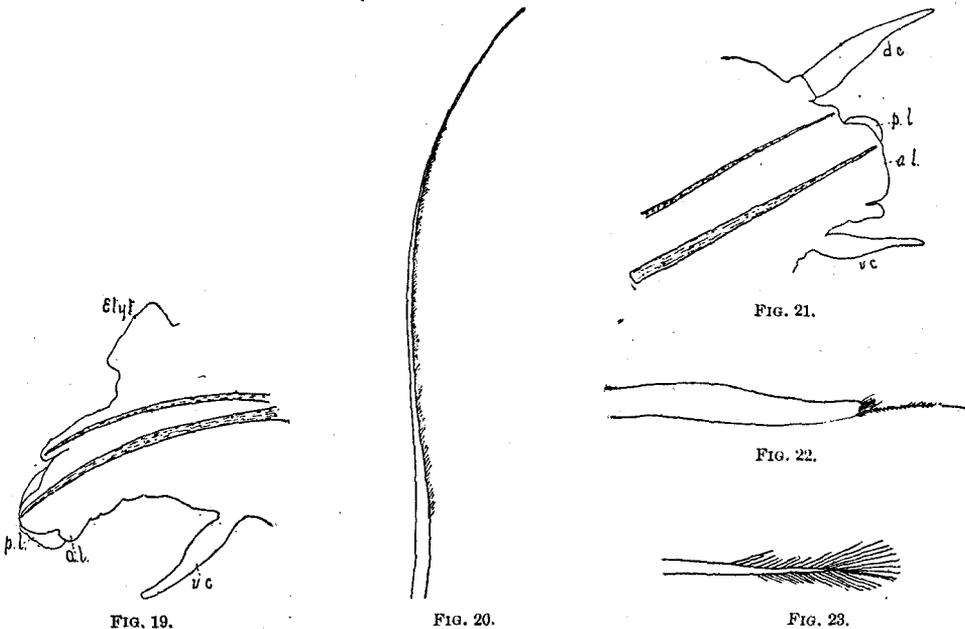
Collected at eleven different stations—nos. 3847, 3848, 3850, 3873, 3876, 3935, 3962, 3968, 3987, 3999, 4147. These had bottoms of coarse sand or gravel, broken shells or corals, and the depths were from 14-79 fathoms. Station 3999 is recorded as 7-148 fathoms, with no indication as to the precise depth where these specimens were found. Apparently they do not ordinarily live below 50 fathoms.

Family ACOETIDÆ.

Genus *EUPANTHALIS* McIntosh.*Eupanthalis oahuensis*, new species.

Of the three specimens (none entire) in this collection, only one retained any trace of antennæ. Head roughly rectangular in outline, with anterior margin a little narrower than posterior; anteriorly on either side a rounded protuberance (sessile eye?), but no trace of pigment appeared (in alcoholic material); tentacles slender, a little shorter than head, arising from ventral surface of head. Owing to the poor preservation of the specimens, this is all that can be said concerning the head. What seemed to be the stump of a median tentacle appeared between the bases of the lateral. Palps long, gently tapering, smooth, diameter at base rather more than one-half that of head.

Width at head, including anterior parapodia, 3 mm. This gradually increases, reaching, at somite 12, a diameter of 6 mm., but narrows again to about 3 mm. at somite 20, continuing at this width throughout the remainder of the fragment.



Eupanthalis oahuensis, new species. (19) Second parapodium, $\times 25$; *elyt.*, elythrofore; *a. l.* and *p. l.*, anterior and posterior lobes; *v. c.*, ventral cirrus. (20) Seta from second parapodium, $\times 165$. (21) Third parapodium, $\times 25$; lettering as in figure 20. (22) Seta from third parapodium, $\times 165$. (23) Seta from posterior somites, $\times 260$.

Elythrofores on somites 2, 4, 5, 7, 9, 11, etc. Elytra very delicate, transparent, anteriorly barely more than covering dorsal surface of parapodium, behind about the twentieth somite, extending nearly to median dorsal line. Edge of elytra smooth, with no processes or lobings.

Second parapodium elongated, the large neuropodium with a bilobed anterior (fig. 19, *a. l.*), and a broader, more rounded, posterior lobe (*p. l.*). Notopodium very small, appearing as a small lobe on dorsal surface of neuropodium. Dorsally is a large elythrofore, *elyt.*, and ventrally a lanceolate cirrus, *v. c.* A large aciculum extends into the neuropodium, while a much smaller one terminates in the notopodium. From the base of the notopodium arises a bundle of very long, delicate setæ, extremely attenuated at the tip. In the specimen figured were 12 of these. The larger ones have serrated, the smaller smooth, edges. Setæ of ventral bundle much larger, their bases extending about as far as base of aciculum, and from $\frac{1}{4}$ to $\frac{1}{2}$ the diameter of this; protruding portion narrower, flattened, and sharp pointed, the whole bent into the form of an elongated crescent; on concave side are 2 rows

of sharp spines, which appear as a single row when seen from the side as in figure 20. Dorsal setæ of this bundle much larger than ventral, but differing from them in no other important respect.

Third parapodium much shorter than second, squarely truncated at the end (fig. 21); posterior lip broad, rounded, anterior lip bilobed; dorsal cirrus with basal and long, lanceolate, terminal joint; apex extending more than half length of cirrus beyond apex of parapodium. Notopodium a small elevation on dorsal surface of neuropodium. Aciculae as in second parapodium. Dorsally a bundle of very fine setæ, like those described for notopodium of second parapodium. On dorsal and ventral surfaces of neuropodium are other setæ like those described above, the ventral bundle containing much the larger number; between these a row (5 in number in parapodium figured) of stout yellow-colored setæ, with curved, bluntly pointed ends. At the apex a bundle of fine bristle-like processes, while from one side of apex arises a long, delicate, colorless spine, with two rows of minute processes along its basal portion (fig. 22).

On following somites, beginning with seventh in one specimen and tenth in another, is another form of seta, found in bundles of 2 or 3 on dorsal surface of parapodium. These have a moderately stout inner axis, with a dense bundle of delicate radiating spines at the apex (fig. 23).

With the exception of the delicate setæ first described, which disappear early, all the above forms of setæ are continued into the posterior portion of the body. The shafts of the setæ increase considerably in length, so that they stand out prominently from the sides of the body.

Fiber glands are present, and the black chitinous ropes secreted by them are prominent in all somites behind the seventh or eighth.

Dental apparatus a long, gently curved maxilla on either side, colorless except for the apex, which is light brown, and on either side a dental plate with about 16 denticulations.

Collected at station 3892, 328 fathoms, on a bottom of fine gray sand. Type no. 5206 U. S. National Museum.

Family SIGALIONIDÆ.

Genus PSAMMOLYCE Kinberg.

Psammolyce fijiensis McIntosh.

Psammolyce fijiensis McIntosh, Report Challenger Expedition, vol. XII, p. 148, pl. XXI, fig. 6, pl. XXII, fig. 4, pl. XXIV, fig. 6, pl. XIII A, fig. 18.

This was originally described by McIntosh from a single incomplete specimen. In the present collection was one specimen, also incomplete, undoubtedly of this species, though differing somewhat from McIntosh's description.

Only the head and about 38 anterior somites remained; length of this portion 11 mm. Proboscis protruding to distance of 4 mm., being about as long as first 4 somites. On either side, above and below, at the end, are 11 papillæ. Four large teeth in pharyngeal cavity. When pharynx is protruded the head is rotated upward so that the anterior pair of eyes, mentioned by McIntosh as invisible from the dorsum, are indistinctly seen through the flattened transparent basal portion of the tentacle.

Terminal portion of tentacle absent, as was one palp. Other palp long, smooth, gently tapering to a blunt point, the tip extending beyond the end of the protruded pharynx, in this differing from McIntosh's specimen, in which the palps were very short.

Elytra cover rather less than half of dorsal surface; inner third of each and dorsal body surface between them densely covered with minute sand grains; anterior edge of each elytron, where it is overlapped by the one in front of it, and outer half of exposed area free from sand.

Some somites show, in addition to the compound setæ described by McIntosh (pl. XIII A, fig. 18), a few having a similar general form, but more slender, paler, and with a longer terminal joint. A few of the larger setæ also show transverse rows of minute serrations near the end of the basal joint.

Collected at station 3847, 23 to 24 fathoms, on sandy and stony bottom.

Genus *THALENESSA* Baird.*Thalenessa oculata* McIntosh.

Thalenessa oculata McIntosh, Report Challenger Expedition, vol. XII, p. 142, pl. XXI, figs. 1, 2, pl. XXIII, fig. 12, pl. XXV, fig. 3, pl. XIII A, fig. 11, 12.

I have identified this species from the description given by McIntosh, though his figures give little aid in determining the character of the head. His figure 1, plate XXI, looks as if the head had been drawn without removing the anterior pair of elytra, and neither this nor figure 2 shows either antennæ or tentacles. His description is, however, so clear that there can be no error in the determination. The compound ventral setæ may show more than two segments in the terminal portion. In the first seta-bearing parapodium I find as many as 9 of these terminal segments.

Collected at station 3833, 142-88 fathoms, on sand, pebbles, and broken shell; station 3955, 20-30 fathoms, on coral rock; station 3936, 79-130 fathoms, on broken shells and corallines, and station 4061, 24-83 fathoms, on coral sand, coralline nodules, and foraminifera.

Family APHRODITIDÆ.

Genus *APHRODITA* Linnæus.*Aphrodita echidna* de Quatrefages.

Aphrodita echidna de Quatrefages, *Anneles* 1, p. 197. McIntosh, Report Challenger Expedition, vol. XII, p. 36, pl. VII, fig. 1, 2, pl. VI A, figs. 2-3.

The setæ of these forms differ somewhat from those described by McIntosh. The large dorsal setæ bend sharply at the end to form a terminal hook, and the ventral setæ of both kinds, instead of a thick basal and slender terminal, pilose portion, show a gradual narrowing from the basal to the terminal parts. The pilose patch leaves uncovered the extreme end, which protrudes as a gently curved, stout spine, resembling in this respect the setæ of *Iphione spinosa* (op. cit., pl. VIII, A, fig. 5). McIntosh states, however, that his figure was drawn from a specimen probably undergoing regeneration.

Just dorsal to the larger ventral setæ in some somites (I could not find them in all) is a bundle of delicate colorless setæ. Each has a strong lateral tooth near its end, and shows a distinct toothing beyond that (fig. 24).

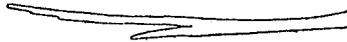


FIG. 24.—Seta from *Aphrodita echidna*, × 183.

Elytra may have more or less of a fulvous coating above and below, or may be entirely free from it. The felt formed by fine threads covering the dorsal surface is filled with débris of various sorts, containing diatoms, radiolaria shells, and small annelid sand tubes.

Collected at stations 4081, 202-238 fathoms, on a bottom of gray sand, and 4082, 256-283 fathoms, on a bottom of fine volcanic sand.

Genus *LETMONICE* Grube.*Letmonice producta wyvillei* McIntosh.

Letmonice producta Grube, Monatsber. k. Akad. zu Berlin, 1877, p. 512.

Letmonice producta var. *wyvillei* McIntosh, Report Challenger Expedition, vol. XII, p. 44, pl. VII, fig. 3, pl. IV A, figs. 9-11.

Dorsal spines nearly all broken or lost, so that it was difficult to get one intact for examination. They agree with McIntosh's description, except that they show numerous nodules along the shaft, which he does not figure. The villous character of the ventral surface is not as marked as in the specimens described by McIntosh.

Collected at station 4004, 773-645 fathoms, on a bottom of brown mud and rock; station 4038, 689-670 fathoms, on a bottom of gray mud and foraminifera; station 4036 on bottom of fine gray sand, in 687 fathoms.

Family PHYLLODOCIDÆ.

Genus PHYLLODOCE Savigny.

Phyllodoce sanctæ-vincentis McIntosh.

Phyllodoce sanctæ-vincentis McIntosh, Report Challenger Expedition, vol. XII, p. 166, pl. XXVII, fig. 9, pl. XXXII, fig. 8, pl. XIV A, figs. 14, 15.

Three specimens were in this collection, one from station 3810 (211-53 fathoms, on a bottom of fine coral sand) being somewhat larger than the one described by McIntosh, having a width of 4 mm. in the widest part. The eyes, also, were much larger than in McIntosh's figure, and I could not find the terminal row of "warts" which he describes for the proboscis. There is a row of 16 papillæ around the proboscis aperture.

Other specimens from station 4098 (95-152 fathoms, on a bottom of coral sand, foraminifera and radiolaria) agreed more closely in size of body and character of proboscis with McIntosh's description than did the above, though the differences in the form of dorsal and ventral cirri in different parts of the body were less than he indicates. McIntosh describes the species as having "large blackish eyes," but figures rather small ones. The present specimens agree more nearly with his description than with his figure.

Phyllodoce tenera Grube.

Phyllodoce tenera Grube, Annulata Semperlana, p. 97, 1878.

So far as I can tell from Grube's description, this specimen belongs to his species. The ventral cirri are filled with a material which turns yellow in preserving fluid, thus presenting a sharp contrast to colorless portion of remainder of body.

Collected at station 3812, 6½ fathoms, on a bottom of coral and coral sand.

Genus ANAITIS Malmgren.

Anaitis tenuissima Grube.

Phyllodoce tenuissima Grube, Annulata Semperlana, p. 95, 1878.

Grube's description is not accompanied by figures, but so far as I could determine from his text this specimen belongs to this species. Grube describes tentacular cirri on 3 somites. This would bring it under the genus *Anaitis* rather than *Phyllodoce*.

Collected at station 3940, 59-70 fathoms, on a bottom of white sand and broken shells.

Family ALCIOPIDÆ.

Genus VANADIS v. Greef.

Vanadis minuta, new species.

Body small, first 21 somites measuring 8 mm.; eyes prominent, light brown in color, broader than any part of anterior region of body; diameter across eyes 2 mm. Seen from above, head shows two prominent eyes, corneal areas not visible in this view; a bridge of tissue extends across from one eye to the other, with a rounded lobe (tentacle?) on its anterior edge (*t?* fig. 25); anteriorly a pair of lanceolate marginal tentacles (*a. t.*, fig. 25). Ventrally, head shows longer tentacles below the lanceolate ones. Only one was present in the specimen (*p. t.*, fig. 26); large corneal areas look downward and outward; between the eyes a series of longitudinal foldings extend down into mouth (fig. 26). Posterior portion of head broad, and extending out like a shallow saucer, in which eye-bearing portion seems to be held. Laterally this is prolonged into a cirrus on either side, with a distinct joint at its base, which extends out under the eye (*c.*, fig. 26).

First somite behind head with a cirrus on either side (fig. 26); second somite with similar but shorter cirri; third somite broader, with longer cirrus, which was present only on one side (fig. 26); fourth somite behind head, with large cylindrical appendages, almost as prominent as eyes (*S. 4*, figs. 25 and 26); each bears on outer edge a small nipple-like protrusion. Two following somites have par-

apodia (lost on one side in the specimen) with a small, transparent, globular dilation at the base (figs. 25 and 26).

Parapodia very short as far as 6th somite, then elongated considerably, so that fully formed parapodium is almost as long as transverse diameter of the body. Dorsal and ventral lamellæ very irregularly distributed, so that I infer they must have been lost on many somites, and I can give no details as to on which somites they first appear. Parapodium from middle of body with lanceolate dorsal and ventral lamellæ, a cirrus extending from apex of setigerous portion, *f. c.* (fig. 27); each bears dorsally the brown segmental organ (*d. s. o.*), which is the only trace of color to be seen behind the

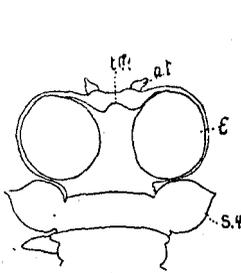


FIG. 25.

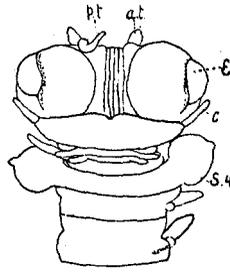


FIG. 26.

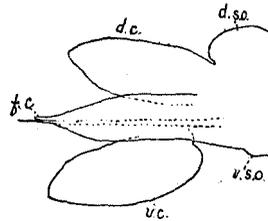


FIG. 27.



FIG. 28.

Vanadis minuta, new species. (25) Dorsal view of head, $\times 12.5$; *e.*, eye; *s. 4*, fourth somite; *a. t.*, anterior tentacle; *tt*, median tentacle (?). (26) Ventral view of head, $\times 12.5$; *c.*, cirrus of first somite; *p. t.*, posterior tentacle; other letters as in figure 25. (27) Parapodium, $\times 50$; *d. c.* and *v. c.*, dorsal and ventral cirri; *d. s. o.* and *v. s. o.*, dorsal and ventral segmental organs; *f. c.*, cirrus at end of parapodium. (28) Seta, $\times 280$.

eyes; anteriorly this organ is not present as a swelling, its location being indicated by a transversely arranged band of brown pigment; setæ longer than parapodium, compound, with terminal portion barely $\frac{1}{4}$ length of basal part (fig. 28).

This species is represented in the collection by one specimen from station 3802, taken in tow net 4 fathoms below surface, and one from 3797, under similar conditions. The latter was very badly preserved, but undoubtedly belongs to this species. The type (no. 5207 U. S. National Museum), from station 3802, measures 12.5 mm. to end of 14th setigerous somite.

Vanadis fusca punctata new species.

Body of medium size, head and first 22 somites together 13 mm. long. Head 2 mm. in diameter; 1st somite behind head nearly same width. Body then narrows gradually to somite 6, which is $\frac{2}{3}$ diameter of head. Later somites gradually widen to 2.5 mm. at somite 15 (measurements exclusive of parapodia). Fragments from posterior part of body twice as wide as this, but these measurements possibly not reliable, as the body had the appearance of having swollen under the influence of reagents. Color anteriorly a very light brown (in preserving fluid). Posteriorly, color entirely lost, except for segmental glands on posterior dorsal surface of all parapodia. These are dark brown in color, and are very prominent.

Head with large eyes, corneal surfaces directed outward and a little downward (fig. 29). The specimen from which figure 29 was drawn was turned a little to the left, so that right corneal area shows from above. A narrow bridge connects the two sides of the head. In front of this, on a slight elevation, is a single median tentacle. Two pairs of anterior tentacles (fig. 29 and fig. 30, dorsal pair only shown in fig. 29). Corneal surface of eye white, remainder dark brown.

On ventral surface of head eyes separated by deep fissure (fig. 30). Buccal frill divided into a median and two lateral portions. Lateral portions each with a stout cirrus (fig. 30). Following somite with a small dorsal and larger ventral cirrus. Next somite with large dorsal and small ventral cirrus. No trace of proboscidean tentacle in the specimens.

Proboscis 11 mm. long when extruded, widening gradually toward the end, with very abrupt widening at extreme end. On either side of this trumpet-shaped end, one edge is drawn out into a flattened, curved, horn-like process with end pointed and bent backward. Edge of opening between these processes thrown into irregular folds. Inner surface of proboscis longitudinally plicated.

Parapodium with broadly lanceolate dorsal and ventral lobes, dorsal larger than ventral, and standing out from the parapodium more prominently. A single terminal cirrus extends considerably beyond the apex of the aciculume (fig. 31).

Setæ numerous, forming a broad fan, a few on dorsal and ventral surfaces somewhat smaller than the others. Setæ compound, terminal joint very small, arising near end of basal portion, as in figure 28, of *Vanadis minuta*. Many setæ show transverse wrinkles at places where they are bent, indicating that they are hollow and their thin walls have collapsed at these places.

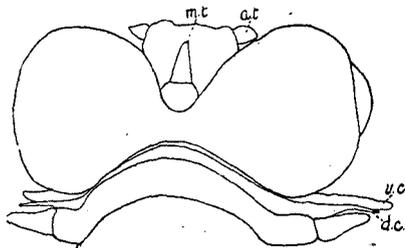


FIG. 29.

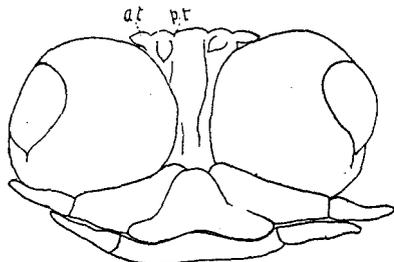


FIG. 30.

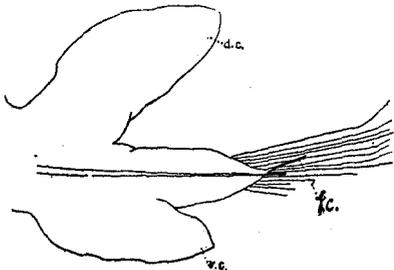


FIG. 31.

Vanadis fusca punctata, new species. (29) Dorsal view of head, $\times 11$; a. t. and m. t., anterior and median tentacles; v. c. and d. c., ventral and dorsal cirri. (30) Ventral view of head, $\times 11$. (31) Parapodium, $\times 18.5$; lettering as in figure 27.

smaller 3.5 mm.; of larger, exclusive of terminal portion, 14 mm.

Larger specimen shows head lobe on one side drawn out into point; on other side this point is broken off; first cirrus slender, short, with acute apex; second cirrus with spine, about equal to parapodial region of body in length. Parapodial region 14 mm. long, with 17 pairs of parapodia. Terminal smooth portion about 10 mm. long. Two broad plates at end of each parapodium, but these not well

Two fragments with heads, and a number from posterior portion of body, taken at station 3889, surface. Other fragments from station 3797, surface, and 4082, 220-238 fathoms, on a bottom of gray sand.

Type no. 5208, U. S. National Museum, a specimen 13 mm. long (incomplete), from station 3889.

Genus GREEFIA (NAUPHANTA) v. Greef.

Greefia oahuensis McIntosh.

Greefia oahuensis McIntosh, Report Challenger Expedition, vol. XII, p. 182, pl. XXVIII, figs. 5, 6, 7, pl. XXXII, fig. 11, pl. XV A, fig. 4.

The specimens agree more closely with McIntosh's description than with his figures. He describes dorsally "a short, flattened tentacle of a somewhat ovate form." This is clearly seen in the specimens, but does not appear in his figure 6. Color varies from light brown to deep purple, dorsal lamellæ of parapodia colorless. Ventral "segmental glands" not very prominent.

Collected at surface at stations 4190, 4011, 3980, and 4188, the latter affording only fragments from the posterior end.

Greefia quadrioculata McIntosh.

Alciopa (?) *quadrioculata* McIntosh, Report Challenger Exp., vol. XII, p. 176, pl. XXVIII, fig. 8, pl. XXIX, fig. 7.

Fragments of a single specimen. I have put it in this genus because of the character of the setæ, which are compound, slender, with a very slender terminal portion attached on one side a little behind the end of the basal portion, as is characteristic of *Greefia*. McIntosh described the head, but had no setæ, and while he put his specimen in the genus *Alciopa*, he noted a general resemblance to *Greefia*. In the peculiar eye structure, this specimen agrees with McIntosh's.

Collected at station 4190, surface.

Family TOMOPTERIDÆ.

Genus TOMOPTERIS Eschscholtz.

Tomopteris sp.

Three specimens, one large and fairly well preserved, and two small and very badly preserved. Length of

enough preserved for description. Brain faintly bilobed, with dark-brown eyes. No trace of parapodial eyes.

These specimens correspond with no species described by either Vejdovsky ^a, Apstein ^b, or Greef ^c, but since sexual differences are considerable in this genus, and the specimens are poorly preserved, I have thought it best not to attempt to give them a new specific name.

Collected at the surface at stations 3802 and 4037.

Family NEREIDÆ.

Genus NEREIS Cuvier.

Nereis (Platynereis) tongabutensis McIntosh.

Nereis tongabutensis McIntosh, Report Challenger Expedition, vol. XII, p. 212, pl. XXXIV, figs. 7, 8, 9, pl. XVI A, figs. 5, 6, 7.

One incomplete specimen from station 3968, 14½–16½ fathoms, on coarse sand and coral, and another from Pearl Harbor, Oahu. The label reads "Taken from mass of sponge."

Nereis sp.

Head broader than long (fig. 32), deeply cleft in front; anterior eyes much the larger, with lens facing anteriorly and outward; lens of posterior eyes facing dorsally. Antennæ and tentacular cirri lost. Palps very large.

First 8 parapodia with cirrus-like neuro- and notopodium. Dorsal cirrus about as long as parapodium, ventral cirrus nearly as long as dorsal. Behind somite 8 dorsal and ventral cirri become abruptly much shorter. Lobes of parapodia remain elongated for some somites, later shortening very decidedly.

Two kinds of setæ, one with short terminal joint having an apical hook with a "wing" and no lateral teeth, the other with very long, smooth, gently tapering terminal joint.

In the absence of information concerning antennæ, tentacular cirri, and jaw apparatus, I have not thought it wise to name this incomplete and possibly immature specimen. Width, including parapodia, 2 mm.; length of 8 somites, 3 mm.

A single specimen, retaining only the anterior end, from station 3968, 14½–16½ fathoms, on bottom of coarse sand and coral.

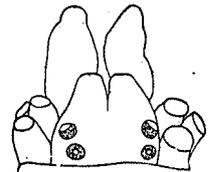


FIG. 32.—Head of *Nereis* sp., × 12.5.

Nereis kobiensis McIntosh.

Nereis kobiensis McIntosh, Report Challenger Expedition, vol. XII, p. 210, pl. XXXIV, figs. 3, 4, 5, 6, pl. XVI A, figs. 2, 3, 4.

Heteronereid phase. McIntosh described the atokous form only. I have identified these specimens, all of which were in the epitokous condition, from the structure of the paragnathi, in which respects they agree exactly with McIntosh's description; from the general character of the head, which agrees better with McIntosh's description than with his figure, and from the presence of peculiar hook-like setæ in the anterior, unmodified feet. The eyes were larger than in McIntosh's specimens (a modification consequent on the sexual phase), and he does not mention a spinous edge on the concave border of the falcate setæ.

Head of female with large eyes (fig. 33), in contact with one another; eye (in alcohol) deep purple in color, with white "lens," pointing anteriorly in anterior eye, upward and backward in posterior eye. Antennæ shorter than head, tapering gently to blunt point. Palps large, with stout basal and terminal joints. In the drawing (fig. 33) these are somewhat foreshortened, as the head in all cases had been bent toward the ventral surface. Tentacular cirri usually had been lost. Longest of remaining ones extended to sixth setigerous somite. Prostomium with a dorsal median prolongation, extend-

^a Vejdovsky, Zeit. f. Wiss. Zool., bd. 31, p. 81.

^b Apstein, Die Alciopiden und Tomopteriden der Plankton Expedition, 1900.

^c Greef, Zeit. f. Wiss. Zool., bd. 32.

ing a short distance into an indentation in posterior dorsal border of prostomium. Some specimens showed irregularly distributed patches of reddish pigment on dorsal surface of head and along dorsal median line. None of the specimens were well preserved, such organs as cirri suffering much disintegration. The account of parapodia, etc., is based on what seemed to be the most normal individuals.

Second parapodium of female (fig. 34) with 4 lobes, one dorsal and one ventral, a long posterior and a short pointed anterior, into which extends the aciculum. Dorsal and ventral cirri with broad base and narrow apex, resembling one another in form, but the dorsal considerably the larger. Setæ compound, terminal joint toothed.

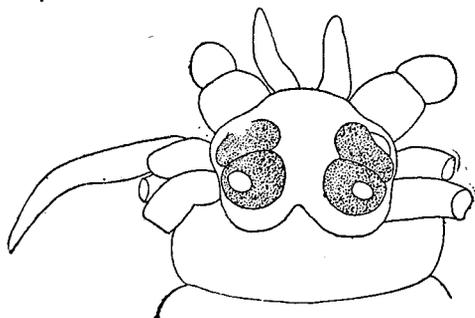


FIG. 33.

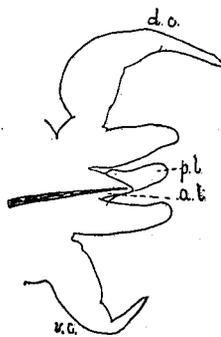


FIG. 34.



FIG. 36.

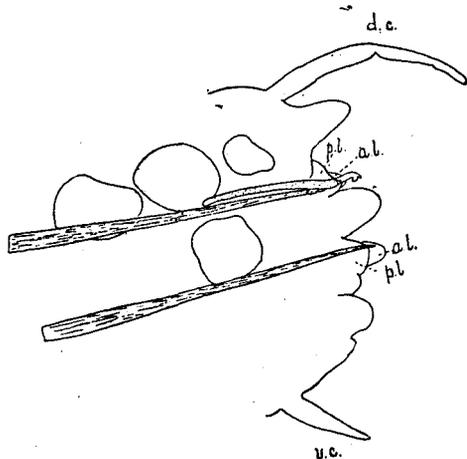


FIG. 35.

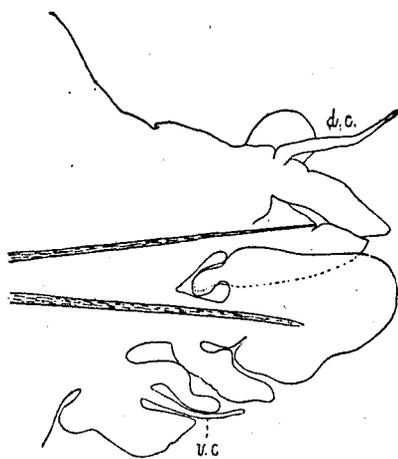


FIG. 37.

Nereis kobeiensis. (33) Head, $\times 11$. (34) Second parapodium of female, $\times 45$; *d. c.* and *v. c.*, dorsal and ventral cirri; *a. l.* and *p. l.*, anterior and posterior lobes. (35) Eleventh parapodium of female, $\times 45$; lettering as before. (36) Falcate seta from eleventh parapodium, $\times 280$. (37) Twenty-fifth parapodium of female, $\times 45$.

Eleventh parapodium of female with slender dorsal and ventral cirrus, and 3 blunt lobes; aciculæ projecting into spaces between these lobes; a shorter posterior and longer anterior secondary lobe at point where apex of aciculum reaches edge of parapodium (fig. 35). Near dorsal aciculum is a peculiar hook-like seta described by McIntosh. Dorsal setæ and dorsal half of ventral bundle with long, slender, toothed terminal joint. Ventral half of ventral seta bundle with few (only 1 in parapodium drawn) setæ like those of dorsal half; most of this bundle with "falcate" setæ. Basal joint with broad end, marked by longitudinally directed spiral lines, with transverse markings between the latter (fig. 36). Apical portion short, with narrow base, widening rapidly to strongly hooked tip, concave edge with about 10 long, narrow spines.

Modified parapodia begin at eighteenth to twentieth somite. Figure 37 shows one from somite 25. A rounded lobe appears at base of dorsal cirrus, and two irregular flattened expansions at base of ventral cirrus. Setigerous lobes elongated and broad, overlapping one another as shown in figure. Neuropodium and notopodium each with fan-shaped bundle of setæ. Setæ (fig. 38) with broad basal joint, into end of which fits the pointed end of the terminal joint; latter very broad, paddle-shaped, with row of minute teeth along one edge; basal joint with very fine transverse striations.

Female larger than male and may reach length of 37 mm.

Male usually not over 10 to 12 mm. long. Head and eyes like those of female. Modified parapodia like female except that dorsal cirrus is broader, and is lobed along ventral margin, as figured for heteronereis phase of other species. Anterior "unmodified" parapodia in general form like those of female, but important differences in the character of dorsal cirrus; that of first parapodium like female, but from here backward the parapodia gradually increase in size until they are very long on somite 7; here they show a thick, cylindrical basal portion, with broad flattened tip ending in an acute point

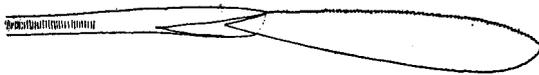


FIG. 38.



FIG. 40.

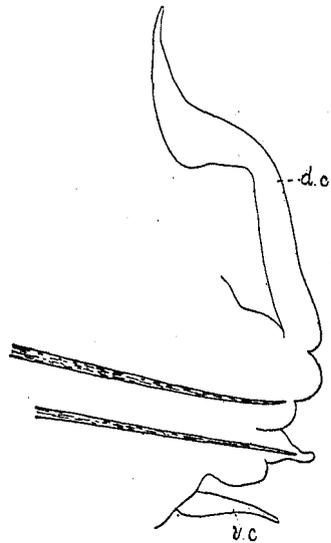


FIG. 39.

Nereis kobiensta. (38) Seta from twenty-fifth parapodium of female, $\times 68$. (39) Seventh parapodium of male, $\times 68$. (40) Seta from anterior somite of male, $\times 280$.

(fig. 39). Setæ as in female except for a single stout dark brown seta in dorsal bundle. On eighth somite dorsal cirrus has usual form, this and following "unmodified" parapodia agreeing closely with those of female except that the lobes are shorter, and compound setæ are like those of somite 8 (fig. 40). There are apparently two pairs of long anal cirri, but on account of poor preservation, it is impossible to be sure on this point.

In both sexes anterior "unmodified" portion of body is filled with sex products, a complete degeneration of dissepiments and an almost complete disappearance of alimentary canal and body wall, muscles having taken place. The sex products apparently arise in the posterior portion and are passed forward into the anterior region, where they are carried until ready to be discharged. Posterior region also well filled with sex products, but no very noticeable degeneration has appeared, except in the dissepiments, which are lacking.^a

Collected in considerable numbers at stations 3851, 3812, 3921, 3843, 3823, 3905, 3850, 3821. Some were marked "surface," others not. It is probable that all were taken while swimming.

^aTreadwell-Biological Bulletin, vol. ix, no. 4, September, 1905.

Family NEPHTHYDIDÆ.

Genus NEPHTHYS Cuvier.

Nephtys sp.

A single fragment of the anterior end of a very small specimen, 1.5 mm. broad in widest part, and of which the first 15 somites measured 3.5 mm., was collected at station 4442, at Harris Point, San Miguel Island, California. It was too much injured for identification.

Family AMPHINOMIDÆ.

Genus NOTOPYGOS Grube.

Notopygos megalops McIntosh.

Notopygos megalops McIntosh, Report Challenger Expedition, vol. XII, p. 18, pl. I, fig. 1, pl. II A, figs. 3 and 4.

A single specimen, 8 mm. long and 4 mm. broad, with 18 somites. The anus opens on the dorsal surface of somite 16. Station 3848, 44-73 fathoms, on a sandy bottom.

Notopygos labiatus McIntosh.

Notopygos labiatus McIntosh, Report Challenger Expedition, vol. XII, p. 19, pl. II, fig. 6, pl. IV, fig. 2, pl. II A, figs. 5, 6.

The anus opens dorsally on somite 22.

Collected from station "3851, surface." It seems very probable that there was some mistake in labelling, as *Notopygos* is not a surface form.

Genus EURYTHOE Kinberg.

Eurythoe pacifica Kinberg.

Eurythoe pacifica Kinberg, Öfvers. of K. Vet. Akad. Forh., 1857, p. 14. McIntosh, Report Challenger Expedition, vol. XII, p. 27, pl. II, figs. 3, 4, pl. III, fig. 3, pl. II A, fig. 13, pl. III A, figs. 5-9.

Two imperfect specimens from station 4031, 27-28 fathoms, on a bottom of fine coral sand, and two, in a better state of preservation, from Honolulu Reef.

Genus CHLOEIA Savigny.

Chloeia flava Pallas.

Chloeia flava McIntosh, Report of Challenger Expedition, vol. XII, p. 8, pl. III, figs. 1, 3, pl. I A, figs. 7 and 9.

I have identified this species from McIntosh's description, these specimens differing from his mainly in coloration. They showed no fan-shaped patch of pigment near the dorsal cirrus, and instead of a row of "brownish purple" dots in each metamere, there are two continuous brown lines extending along the dorsal surface, one on either side the median plane. Some dorsal setæ are very long, slender, with a lateral spur, but with no teeth on the terminal portion. They are colored yellow as far as the lateral spur, but are colorless beyond this. Ventrally are similar, but stouter, colorless setæ.

Collected at stations 3846, 3847, 3848, 3874, and 3876, at depths varying from 21 to 60 fathoms, on sandy or gravelly bottom.

Genus EUPHROSYNE Savigny.

Euphrosyne heterobranchia Johnson.

Euphrosyne heterobranchia Johnson, Polychæta of Puget Sound Region, Proc. Boston Soc. Nat. Hist., vol. 29, no. 18, p. 402, pl. 6, figs. 60-66 a-c.

A single specimen, differing from Johnson's description only in the possession of 9 branchiæ on a side.

Collected at station 4551, in the vicinity of Monterey Bay, Cal.

Genus *HERMODICE* Kinberg.*Hermodice pennata*, new species.

Head roughly quadrangular, anterior edge a trifle broader than posterior (fig. 41). The four large, light brown eyes and the thick median tentacle occupy nearly the whole dorsal surface of head. Anterior eyes a little larger than posterior, all prominent on dorsal view. Median tentacle relatively thick, situated about in center of rectangle, of which the eyes form the corners, tapering gradually to apex, which extends beyond oral lobe. Ends of tentacles and of cirri near the head looked as if either a collection of granular débris had adhered to them, or as if a terminal dilation, originally present, had broken into fragments during the preservation. Inner paired tentacles in form of an elongated cone, extending as far as base of median. Outer paired tentacles about same size as unpaired. Oral lobes prominent, rounded.

Caruncle in two parts. A short, triangular anterior portion, with transverse markings, its rounded base touching the median tentacle and covering over the anterior pair of eyes. Below and behind this the much broader posterior portion extending laterally so as to cover the whole dorsal surface of the first three somites between the parapodia. Greatest width of caruncle about middle of somite 3, tapering from there to end at posterior edge of somite 4. Caruncle composed of a central vertical lamella, and on either side lateral lamella, also vertical. Apparently there are typically 7 of these on a side. In the specimen figured the first one on the right had been lost, and the fifth on the left broken off, not far from the base. Those of the two sides are arranged in an alternating fashion. Along each runs an axial band of pink pigment (in alcoholic material) with numerous branches on either side, giving the whole caruncle a feathery appearance.

Dorsal cirri with stout basal and slender conical terminal portion; ventral similar in form, but smaller; first ventral cirrus largest, those behind it diminishing gradually in size toward posterior end.

Gills on first somite as about six rounded lobes, arising from a common, rather broad, base. By segment 10, the number of these lobes has doubled. All gills with accumulation of pinkish brown pigment on dorsal surface, apex colorless.

Dorsal surface of each somite with numerous longitudinal pink bands extending across from one boundary to the other. Some are single, others branch, and others are incomplete, extending only a part of the way across.

Setæ of dorsal bundle long, very finely pointed; those of ventral bundle shorter, stouter, with fine denticulations along one edge.

Collected at station 4162, 24 fathoms, on a coral bottom. Type (no. 5209, U. S. National Museum), an incomplete specimen; length of head and first 15 anterior somites, 14 mm.; greatest width, 5 mm.

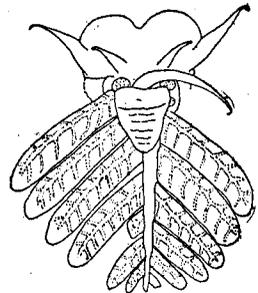


FIG. 41.—Head of *Hermodice pennata*, $\times 12$.

Family EUNICIDÆ.

Genus *EUNICE* Cuvier.*Eunice siciliensis* Grube.

Eunice siciliensis Ehlers, Die Borstenwürmer, p. 353, pl. 16, 1864. (See Ehlers's paper for references to earlier literature.)

The wide distribution of this species is noteworthy. Described originally from a European locality, it has been collected at Porto Rico^a, and now appears in this collection from the Sandwich Islands. Collected at station 3849, at a depth of 73-43 fathoms, on a bottom of broken shells and corals; at station 3876, 28-43 fathoms, on a bottom of coarse sand, and at station 3940, 59-70 fathoms, on a bottom of sand and broken shells.

^aTreadwell—Polychæτους Annelids of Porto Rico, Bull. U. S. Fish Commission, vol. xx, 1900, p. 196.

***Eunice vittata* Delle Chiaje, var.? McIntosh.**

Eunice vittata Delle Chiaje, var.? McIntosh, Report Challenger Expedition, vol. XII, p. 276, pl. XXXVIII, figs. 3, 4, 5, pl. XIX A, figs. 16, 17.

A single small specimen, from station 4021, on a bottom of coarse sand and foraminifera, at a depth of 286-399 fathoms.

***Eunice collaris* Grube.**

Eunice collaris Grube, Annulata Semperiana, p. 158, pl. IX, fig. 3, 1878.

I have identified these specimens from the figure and brief description given by Grube in the above reference. At Hilo was collected an entire individual, very small, and evidently immature, and a portion from the middle of the body of a much larger specimen. The smaller, entire specimen corresponds with Grube's description in the form of the head and its appendages, and in the

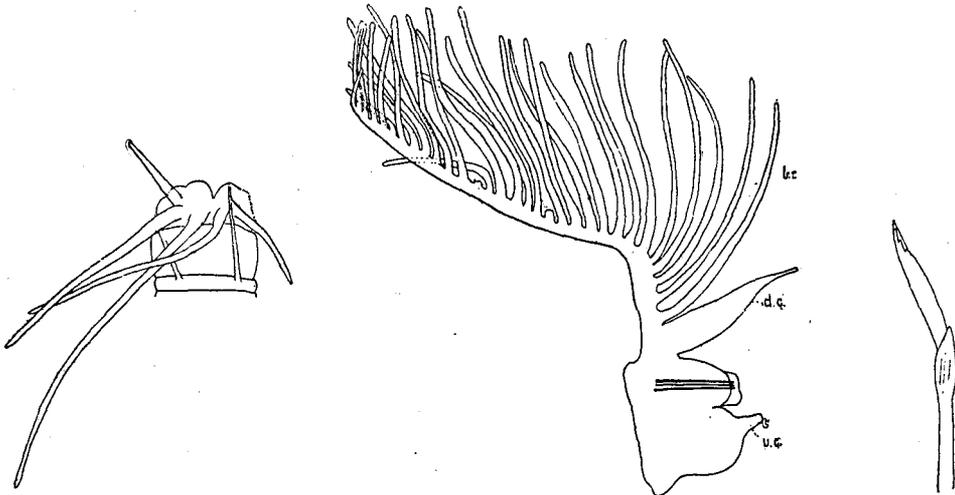


FIG. 42.

FIG. 43.

FIG. 44.

Eunice hawaiiensis, new species. (42) Head, $\times 3.5$. (43) Eleventh parapodium, $\times 10$; br., gills; d. c., and v. c., dorsal and ventral cirri. (44) Ventral seta, $\times 10$.

fact that the dorsal surface is thickly studded with small, white spots. The gills begin on somite 17.

At Laysan were collected fragments of the anterior end of two individuals. Both were badly preserved, but one retained enough of the head and its appendages to admit of identification. The white spots were very faint, but the surface showed the brilliant iridescence mentioned by Grube.

Maxillæ rather strong, gently curved. Right and left dental plate each with 4 teeth. Right paired plate with 6, left with 5 teeth. Left unpaired with 3. This is, in each case, one less than was described by Grube for the corresponding plate. It is possible that he described as a tooth the projecting basal portion of each plate.

Dorsal setæ of two kinds, one long, sharp-pointed, tapering gently to their tip; in each somite a few (one to a somite?) comb-shaped setæ (brush-shaped setæ of McIntosh). Ventral setæ compound, basal portion heavy, with lateral denticulations on its distal end; terminal portion relatively small, with numerous denticulations along the edge, and with terminal and subterminal teeth, the "guard" barely extending beyond the latter; anteriorly, each parapodium with 2 aciculæ; toward posterior end, a third aciculum with hook-shaped end appears in the ventral part of the parapodium.

***Eunice hawaiiensis*, new species.**

Prostomium rather deeply bilobed, each lobe subdivided by two shallow grooves so as to present a 3-lobed appearance (fig. 42). Tentacles long, smooth, tapering uniformly to the apex, inner lateral reaching to eighth somite, median to fifteenth, outer lateral to second. Tentacular cirri slender, tapering, reaching to anterior border of prostomium. Eyes large, brown, in usual position.

Mandibles dark brown, with lighter colored edges. Each half of nearly uniform diameter throughout, curving gently outward at anterior end. Maxillæ stout, gently curved; left dental plate with 8 teeth; left paired with about 12, left unpaired with 8; right dental with 9, right paired with about 12. Color pale, with only toothed edges darker.

Gills begin on second parapodium, there rather small, with axis and 3 lateral branches; on third parapodium gill much larger, reaching mid-dorsal line, and with 12 branches; from fourth setigerous somite (sixth body somite) gills overlap in mid-dorsal line, this overlapping continuing until about the twenty-fifth somite, where gills begin to shorten until, on about somite 45, each has only 3 branches. On somite 50 gill is composed of only a small cirrus-like outgrowth from the dorsal cirrus. In its greatest development, the gill may have as many as 30 branches. (See fig. 43, of eleventh parapodium. Note the bend in the axis of the gill, which brings its terminal portion to lie parallel to the dorsal surface of the body.) Setigerous lobe with a rounded posterior, and a longer, nearly rectangular, anterior lobe. Into the latter extend the large aciculæ. Dorsal setæ long, gently curved, tapering gradually to a sharp point. At the point where curving begins, they are somewhat broader than elsewhere, with minute denticulations along the concave edge. Ventral setæ compound; basal portion long, expanded slightly at end, terminal portion narrow, sharp pointed at apex, with a terminal and a subterminal tooth (fig. 44). On posterior parapodia the teeth on the compound setæ are more prominent, and there are minute denticulations on both proximal and distal joints.

Type (no. 5210, U. S. National Museum) an incomplete specimen, retaining only the anterior 125 somites; length of this, 115 mm.; peristomium 4 mm. wide; body diameter increases gradually to about 50 mm. behind head, where it is 7 mm.; body (in formalin) a pale flesh color; gills white. Collected at station 4134, on bottom of fine coral and volcanic sand, at depth of 324-225 fathoms.

A second much smaller specimen, not more than one-quarter the size of the above, and with gills beginning on the fourth somite, was collected at station 4021, 286-399 fathoms, on a bottom of coral sand and foraminifera.

Eunice interrupta, new species.

Prostomium broader than long, with a well-marked, though shallow, depression on the anterior border. Peristomium longer ventrally than dorsally, the median tentacle seeming to lie in a slight depression on its anterior edge. All tentacles moniliform, the constrictions being a little less distinct at the base than at the tip. Median tentacle extending to posterior border of ninth somite, inner laterals to somite 8, outer laterals to somite 3. Eyes large, brown, situated lateral to base of inner lateral tentacles and posterior to base of outer laterals.

Second somite one-third length of peristomium, its articulated cirri reaching to anterior border of eye. Dorsal cirrus of anterior parapodia noticeably moniliform, resembling the tentacles in this respect, becoming less noticeable, however, in succeeding somites, as in figure 45 of the twelfth parapodium, where dorsal cirrus shows merely a jointing. This jointing disappears at the twenty-second somite.

Gills first appear as a 1-branched appendage to the fifth parapodium; on the seventh they are 2-branched; on the eighth they are 3-branched, on the fifteenth they become 2-branched again; on the twenty-first there is but one. There is some variation in this gill arrangement, some somites in the middle of the body apparently lacking them. In the type a very small single branch is found in all somites, posterior to second.

Ventral cirri short and stout anteriorly, longer and narrower posteriorly. Two long, faintly articulated dorsal anal cirri. Ventral anal cirri, if originally present, had been lost.

Dorsal setæ long, simple, sharp-pointed at apex. Ventral setæ compound, basal portion with broad end, a single large tooth at the apex, and a row of fine denticulations down the side (fig. 46). Terminal

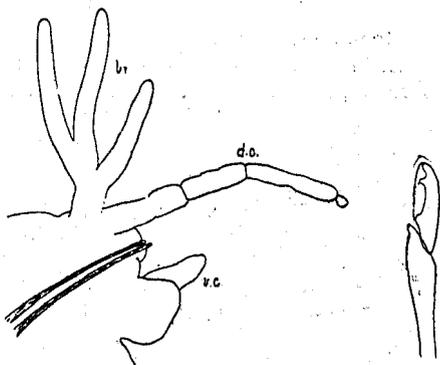


FIG. 45.

FIG. 46.

Eunice interrupta, new species. (45) Twelfth parapodium, $\times 45$; br., gills. (46) Ventral seta, $\times 280$.

piece with tooth at apex and a second blunter tooth just behind this. "Guard" extending beyond teeth, finely serrated along its edge. One specimen of about 70 somites had a body length of 60 mm. and a greatest width of 4 mm.

Another, a sexually mature individual, showed the following conditions on one side of the body:

Somite vi, gill of 1 branch.

Somite vii, gill of 2 branches.

Somite viii, gill of 3 branches.

Somite xi, gill of 4 branches.

Somite xiii, gill of 3 branches.

Somite xx, gill of 2 branches.

Somite xxi, gill of 1 branch.

About the middle of the body the gills disappeared to reappear toward the posterior end.

Collected at stations 3834 and 3821 in surface hauls; 3850, 43-46 fathoms, on a bottom of coarse sand and broken shells; 3848, in essentially similar conditions as the last, and at 3940, 59-70 fathoms, on a bottom of white sand and broken shells.

Type no. 5211, U. S. National Museum. A specimen 55 mm. long, but incomplete posteriorly, from station 3850.

Eunice bilobata, new species.

Prostomium deeply bilobed, though its precise form is difficult to determine owing to distortion produced by the protrusion of the pharynx and jaw apparatus. Body grayish in color, with a marked iridescence, all parapodia and gills light brown (in alcohol). Tip of dorsal cirrus white, with a sub-terminal band of dark brown. Tentacles and cirri show no trace of articulations. Median tentacle extends to eighth somite, though possibly not entire in the single specimen. Inner lateral about equal in length to median. Outer lateral arise close to inner lateral, about four-fifths the length of latter and more slender. Eyes difficult to see, situated between bases of outer and inner lateral tentacles. Tentacular cirri extend to anterior end of prostomium, their ends colored like dorsal cirri of parapodia. All cirri much wrinkled, but with no trace of articulations.

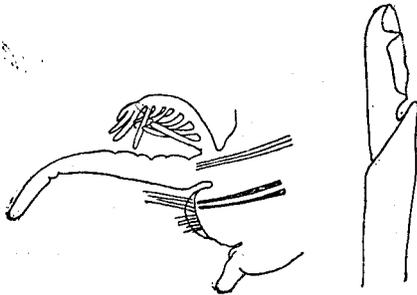


FIG. 47.

FIG. 48.

Eunice bilobata, new species. (47) Seventh parapodium, $\times 11$. (48) Ventral seta, $\times 180$.

Mandibles flattened and thin at their ends, united with one another by a very narrow crosspiece on the concave median edge. Maxillæ flattened at their bases, their outer ends cylindrical, smooth, and uniformly curved. Right and left dental plates each with 5 teeth. Right lateral paired plate with 10 teeth, left lateral with 7. Left unpaired plate with 3 teeth. A single accessory plate with acute apex on either side. Dental apparatus brown in color, this being very dark in the maxillæ and lighter in the other parts. Tips of teeth on lateral plates white.

Branchiæ begin on seventh parapodium, each with main axis and 9 lateral branches (fig. 47). On somite 34 there are 15 or 16 of these, one having bifurcated tips. On a somite from farther back in the body (taken from a fragment so that its precise position could not be determined) the main axis was much larger than the dorsal cirrus, and its diameter great in proportion to those of the 18 small branches which were situated along its inner face.

Parapodium with two large, black aciculæ extending into the bases of the setæ. A bundle of finer, sharp-pointed aciculæ extend into the dorsal cirrus, and in somites behind the twentieth a third group protrudes from the surface just above the ventral cirrus. In one parapodium there was only one of these, in another there were three. Ventral cirrus with swollen base, forming a prominent swelling on ventral surface, and a smaller, rounded, terminal portion.

Dorsal setæ long, fine-pointed, curving gently toward the end. Ventral setæ compound, basal portion broader at tip than at base. Terminal portion short, narrower than apex of basal, with a terminal and a subterminal tooth. "Guard" not continued around end, finely denticulated along the edge (fig. 48). Anteriorly each parapodium with a rounded lobe which projects beyond the bases of the setæ.

The collection contained fragments of a single specimen. One fragment of the anterior end of the body consisted of head and 35 somites. Length, 19 mm.; breadth, exclusive of parapodia, 5.5 mm.

Collected at station 3871, at a depth of 13.43 fathoms on bottom of fine white sand. Type no. 5212, U. S. National Museum.

***Eunice nicidioformis*, new species.**

Body narrow in proportion to length. Largest specimen contained 100 somites, was 43 mm. long, and 2.5 mm. wide without the parapodia. There is a slight increase in width from the first to the sixth somite, while posterior to this the body tapers gradually to the end. Color in alcohol, light brownish yellow, with marked iridescence. Anterior somites show a pearly luster, most noticeable in somite 6.

Prostomium rounded, with median frontal indentation (fig. 49). Median tentacle reaches to fifteenth somite, inner laterals to tenth, outer laterals only to third. Tentacular cirri extend to

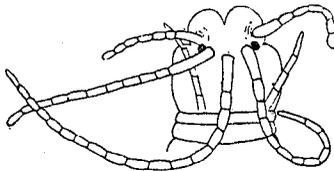


FIG. 49.

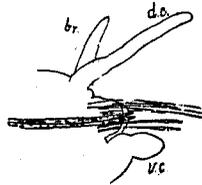


FIG. 50.

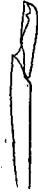


FIG. 51.

Eunice nicidioformis, new species. (49) Head, $\times 5.5$. (50) Anterior parapodium, $\times 56$; d. c., dorsal cirrus; br., gill. (51) Ventral seta, $\times 188$.

anterior face of outer lateral tentacles. All tentacles and cirri articulated, this being most noticeable in the outer laterals, which are almost moniliform. Anal cirri two pairs, dorsal ones long, articulated, ventral much shorter, pointed.

Maxillæ light brown, apex cylindrical, gently curved. Great dental plates each with 6 teeth, margins brown, lateral portions white; left paired plate with 7 teeth, left unpaired with 5; right paired with 9. All plates colored only on their inner margins.

Gills at first sight seem to be absent, whence the specific name. On some anterior appendages, however, is a very small gill (fig. 50). On largest, sexually mature individual, these begin on somite 7 and end on somite 37.

Parapodium with long unsegmented dorsal cirrus (fig. 50). Ventral cirrus proportionately rather large. Simple setæ long, flattened, curving gently toward distal end; apex sharp-pointed. Compound setæ rather slender, basal portion with distal end slightly broader than the terminal portion (fig. 51), latter with a terminal and a subterminal tooth, and a "guard" extending slightly beyond the former. In anterior parapodia are two large black aciculæ. Posteriorly there may appear a third aciculum, ending just dorsal to the ventral cirrus. Parapodia with a rounded posterior lobe extending beyond the bases of the setæ.

Collected at station 4077, 99-106 fathoms, on bottom of fine coral sand and foraminifera; from station 4098, 95-152 fathoms, with a bottom essentially like the former, and from station 4101, 143 fathoms, on coral sand and foraminifera. Type no. 5213, U. S. National Museum, a specimen 47 mm. long, collected at station 4098.

***Eunice biannulata* Moore.**

Eunice biannulata Moore, New Polychæta from California, Proc. Acad. Nat. Sci. Philadelphia, vol. LVI, 1904, p. 484.

These show very considerable differences from the specimens described by Moore under the above name. Closer examination shows, however, that in the character of setæ and jaws, and in mode of origin of gills, they agree very closely with his description. In one the head agreed with the type, while in the others there had been so much contraction due to the preservation that the precise character of the tentacular annulations was hard to determine. The main differences are in size, the largest having a length of 190 mm. and a width of 10 mm.

Collected from station 4551, vicinity of Monterey Bay, California.

Eunice sp.

From stations 4015 and 3822 were collected members of this genus, those from the former station too much injured for identification, the latter evidently an immature form.

Genus *LUMBRICONEREIS* Blainville.*Lumbriconereis grandis*, new species.

A rather large species, 3.5 mm. in diameter at the prostomium, 5 mm. at somite 35. No entire specimens were in the collection, but some fragments of the posterior end which were preserved were scarcely more than half as broad as the anterior portions.

Head (fig. 52) bluntly rounded, length about equal to breadth. No eyes were visible. The head in each case was bent dorsally, owing to the position assumed by the animal when killed. When bent back to its proper position, there appears on either side a shallow depression at posterior edge of head.



FIG. 52.



FIG. 53.

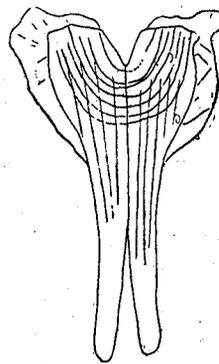


FIG. 54.

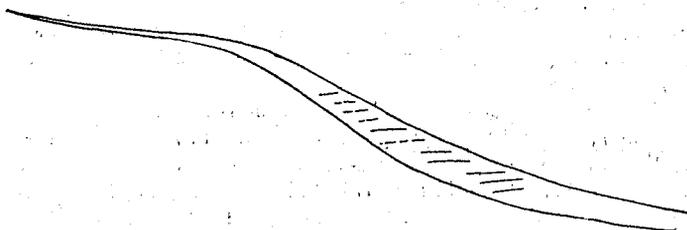


FIG. 55.



FIG. 56.

Lumbriconereis grandis, new species. (52) Head, $\times 2.5$. (53) Right maxillary apparatus, $\times 9$; ac, accessory plates. (54) Mandible, $\times 9$. (55) Seta, $\times 183$. (56) Hooked seta, 183.

In the jaw apparatus each lateral plate has 4 teeth (fig. 53); anteriorly on either side are two smaller plates, roughly triangular in form, with toothed apex pointing toward median line. The whole is surrounded by thin chitinous plate (not shown in figure), in which at two points are seen darker patches (accessory plates, ac fig. 53). All mouth parts very dark brown, mandibles a very little lighter in color than maxillæ, the two halves separated posteriorly for more than half their length. Anteriorly a wing of thin, transparent chitin surrounds the end of the mandible (fig. 54).

Setæ arranged in vertical rows in each parapodium. Base of seta dark brown, apex lighter, this difference in color very noticeable in entire annelid.

Parapodium with anterior and posterior lobes, the posterior slightly the longer, and with a dorsal, acute tip; this structure less noticeable in anterior than in posterior somites. Toward posterior end whole parapodium becomes very prominent, and distinction between it and body is much sharper than anteriorly. Anterior and posterior lobes about as long as basal portion of parapodium. Setæ of two

kinds, in anterior somites stalk long, cylindrical, terminal portion flattened, bent, and with acute apex (fig. 55); posteriorly stout, hooked setæ, with denticulated end surrounded by a "guard" (fig. 56). There may be a number of stout, very dark aciculæ in each parapodium, extending to a considerable distance beyond its end. The end is rounded and more transparent, having a reddish color by transmitted light.

In many respects this form agrees with the description of *L. japonica* Marenzeller, as given by McIntosh (Challenger Reports, vol. XII, p. 243). It differs mainly in the character of the jaws, and in the absence of compound setæ. It is possible that the latter may have been lost.

Fragments of 4 specimens were collected at station 4132, 257-312 fathoms, on a bottom of fine gray sand and mud, and from 4027, 319 fathoms, with a bottom similar to the former.

Type no. 5214, U. S. National Museum. Length of first 50 somites about 15 mm.; collected at station 4027.

Lumbriconereis minuta, new species.

Length 20 mm., breadth 2 mm. Possibly an immature form.

Head moderately elongated, about as wide as long, with blunt apex. No eyes. Maxillary apparatus black, the maxillæ gently curved, rather stout. Dental plate on right with 5 teeth, on left with 4. Anterior to these are various accessory plates, which in the preparation showed as in figure 57. As these were more or less injured in removing they probably do not accurately represent the natural condition.

Parapodium uniramous with posterior lip longer than anterior. Setæ few in number, of 2 kinds; one stout, with one large and a series of smaller hooks, the whole surrounded by a translucent "guard" (fig. 58); the second form very long, slender, tapering to apex with a wing along edge of distal two-thirds, winged portion bent so as to form an angle with basal portion.

Collected at station 4083, 238-253 fathoms, on a bottom of fine gray sand. Type no. 5215 U. S. National Museum. A specimen 20 mm. long.

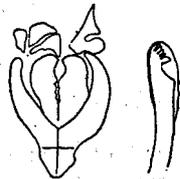


Fig. 57. Fig. 58.

Lumbriconereis minuta, new species. (57) Jaw, $\times 57$. (58) Seta, $\times 280$.

Genus ARABELLA (Grube) Ehlers.

Arabella iridescens, new species.

An incomplete specimen, about 75 mm. long. Width of first somite, 2 mm., toward posterior end of fragment, 4 mm. Anterior parapodia about two-thirds length of later ones, reaching full length at about somite 16.

Head rounded, nearly as broad as first somite, length equal to first 3 somites (fig. 60).

Parapodium uniramous (fig. 59) with a long median lobe arising posterior to the setæ, and extending about half way of their length. A very small dorsal cirrus, no ventral cirrus. Most setæ had been broken. Figure 59 shows as well preserved a parapodium as I could find, with 3 intact setæ. Imbedded in the parapodium were a number of the basal portions of other setæ which had broken away. A single seta, looking as if intact, had a rounded end. Two very delicate colorless spines protruded from the parapodium just dorsal to the setæ.

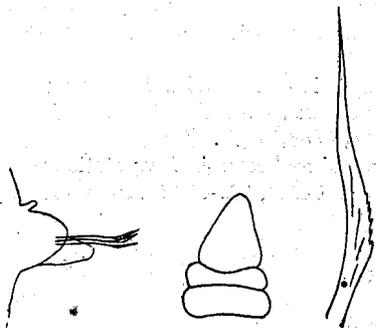


Fig. 59. Fig. 60. Fig. 61.

Arabella iridescens, new species. (59) Parapodium, $\times 23$. (60) Head, $\times 5$. (61) Seta, $\times 138$.

Setæ (fig. 61) with basal portion cylindrical, terminal portion flattened and bent, ending in an acute point. At outer edge of bend a row of minute, sharp, denticulations.

Collected at station 3856, in 127 fathoms, on a bottom of fine sand and yellow mud. Type no. 5216, U. S. National Museum.

Arabella attenuata, new species.

Length, 90 mm. Width, without parapodia, 2.5 mm. Color in alcohol, pale yellow.

Head (fig. 62) oval lanceolate, about as long as first 2 somites. Eyes, two pairs, brown, the inner larger and more prominent than outer. Mandibles jet black except at their anterior ends, which are light brown, united for about two-fifths of their length, tapering gently to blunt point posteriorly. Right maxillæ with 4-toothed plates, increasing in size from before backward; first with 4 equal teeth, second with 5 teeth, increasing in size from before backward, third with 4 or 5 much larger teeth than occur in either of the others, fifth with 6 or 8 prominent teeth. The left maxillary plates were too badly broken to be described. A long, narrow, light-brown chitinous rod terminates the maxillæ posteriorly.

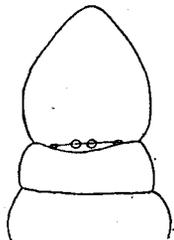


FIG. 62.—Head of *Arabella attenuata*, new species. $\times 9$.

Parapodium of tenth foot with rudimentary cirri, with posterior lobe large, blunt, extending upward and backward. A very broad, bluntly rounded aciculum extends to some distance from apex. Setæ few in number, with broad curved end provided with a wing and tapering to an acute point. Minute serrations along wings near their basal portion. Near base of large setæ are smaller ones, differing from these mainly in size. Other parapodia essentially similar to the tenth.

Collected at station 4551, vicinity of Monterey Bay, Cal. Type no. 5217, U. S. National Museum, 90 mm. long, 2.5 mm. broad.

Genus *NOTHRIA* Johnston.*Nothria macrobranchiata* McIntosh.

Nothria macrobranchiata McIntosh, Report Challenger Exp., vol. XII, p. 320, pl. xLI, figs. 1, 2, 3, pl. xxII A, figs. 6, 7.
Nothria macrobranchiata Moore, Polychæta from the Coastal Slope of Japan and from Kamchatka, Proc. Acad. Nat. Sci. Philadelphia, vol. LV, June, 1903, p. 445.

A number of specimens, mostly imperfect. McIntosh describes median tentacle as shorter than adjacent ones. In these specimens it was slightly longer. The left unpaired plate of the dental apparatus had 9 teeth in these specimens instead of 11, as figured by McIntosh. The branchiæ were shorter and broader than those figured by McIntosh, though the difference may have arisen, as he says, because of a difference in the condition of the blood vessels. Branchiæ in one specimen appear first on the ninth, in another on the tenth somite. In addition to setæ described by McIntosh, there is a bundle of very small "brush-shaped" setæ situated just dorsal to the base of the larger "dorsal setæ."

As noted by Moore, branchiæ extend to posterior end of body. No anal cirri were preserved in the single complete specimen of this collection. The tubes have the usual membranous foundation, and are thickly covered on the outside with small pebbles and bits of coral rock.

Collected at station 4007, 508-557 fathoms, on bottom of gray sand and foraminifera; stations 4021 and 4022, 286-399 fathoms, bottom of coral sand and foraminifera, and 4041, 382-253 fathoms, on gray mud and foraminifera.

Genus *MARPHYSA* De Quatrefages.*Marphysa teretiuscula* (Schmarda).

Eunice teretiuscula Schmarda, Neue wirbellose Thiere, I, bd. II, p. 129, taf. 32, fig. 259.

These differ from Schmarda's description in that the gills are 3 instead of 4 branched in their greatest development.

Collected at Honolulu Reef.

Family STAUROCEPHALIDÆ.

Genus STAUROCEPHALUS Grube.

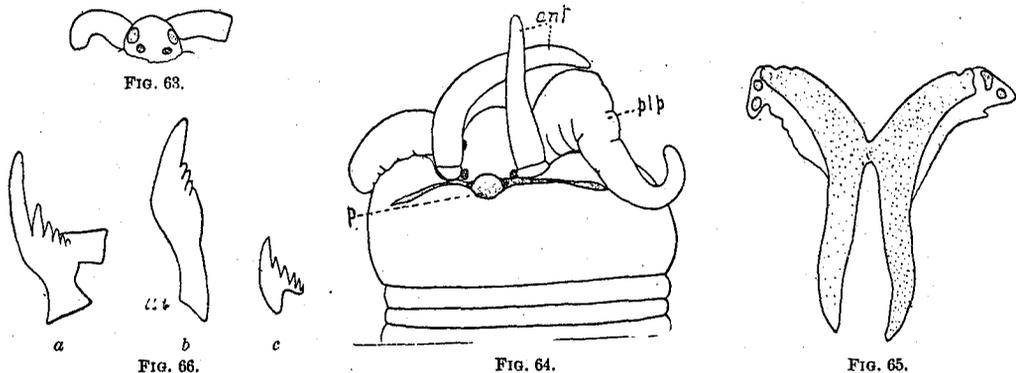
Staurocephalus australiensis McIntosh.

Staurocephalus australiensis McIntosh, Report Challenger Exp., vol. XII, p. 232, pl. xxxvi, fig. 6, pl. xvii A, figs. 9, 10.

The present collection includes two specimens, one an adult female with eggs, which retained its tentacles, the other smaller and badly mutilated. I have identified the species from McIntosh's description of the parapodia and setæ. To his description I can add the following:

Head rounded, with large anterior and small posterior eyes (fig. 63, of smaller, imperfect specimen). Antennæ slender, tapering, about three times as long as head. Palps thick at base, tapering to slender apex (fig. 64). In the preserved specimen each is tightly coiled on the side of the head. Prostomium 1 mm. broad. Peristomium 5 mm. broad. Proboscis stout, with black teeth at apex. On dorsal surface of proboscis, just below palp, a small tubercle on either side.

Peristomium five times as broad as prostomium, and about two times as long. In preserved specimen it extends on either side to anterior border of prostomium. Behind latter is a broad depressed area, with its posterior lateral angles elongated toward side of body. In the middle of this space is a small papilla which extends forward over the prostomium (p. fig. 64.)



Staurocephalus australiensis. (63) Mutilated head showing eyes, $\times 7$. (64) Entire head, $\times 8.5$. (65) Mandibles, $\times 23$. (66a) Tooth of inner row of maxillary apparatus, $\times 115$. (66b) Tooth of outer row, $\times 115$. (66c) Tooth of middle row, $\times 115$.

Mandibles jet black (fig. 65) with minute black pieces at either side their dorsal end, imbedded in a thin translucent "wing" of material that extends down side of mandible. Maxillary apparatus of two double rows of teeth, an inner row with teeth like figure 66 a, and an outer like figure 66 b. In each row the teeth progressively diminish in size and in the number and size of their lateral denticulations from ventral toward dorsal surface. Between the two rows, on at least the right side, is one or two rows of teeth (like figure 66 c) which apparently do not reach the surface, and may be younger teeth, forming to take the place of the others.

McIntosh describes a difference between the superior and inferior setæ of the upper group, the former tapering, flattened toward the tip, the latter less attenuate, and notched at the end (see his pl. xvii A, fig. 9). In these specimens the superior setæ correspond to McIntosh's figures of the inferior ones, while the inferior setæ are shorter, broader, with bifid tip and guard, like those of terminal joints of setæ of ventral bundle. Ventral setæ as in McIntosh's description.

Collected at station 3873, 32-37 fathoms, on coral pebbles, and from station 4034, 28-14 fathoms, on fine coral sand and foraminifera.

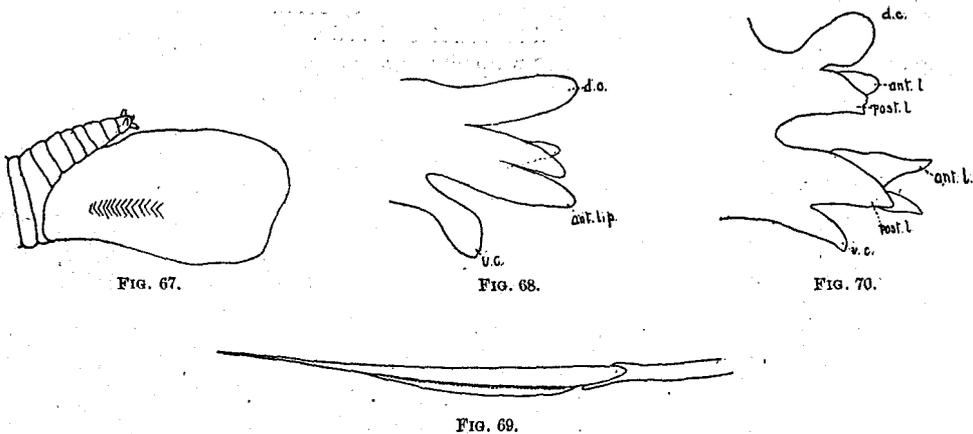
Family GONIADIDÆ.

Genus GONIADA Audouin et Milne-Edwards.

Goniada brunnea new species.

Head elongated, conical, 4 tentacles at apex. Latter poorly preserved, but seeming to show a larger basal and smaller terminal joint. Head with about 8 annulations, though at the base the boundaries of these were hard to make out. Pharynx exerted $3\frac{1}{2}$ times as long as head (fig. 67). Pharynx with on either side a row of 14 V-shaped teeth (fig. 67). No teeth in terminal portion of pharynx:

Body well rounded anteriorly and posteriorly, with parapodia inserted on median lateral face. Anteriorly two fine longitudinal lines run along the dorsal surface, bounding, with the intersegmental grooves, a rectangular median area in each somite. Farther back a transverse line runs across the middle of each somite, uniting the two longitudinal ones, and dividing the rectangular area above mentioned into two. Still farther back the lateral lines disappear, and the transverse line bends posteriorly



Goniada brunnea, new species. (67) Head, $\times 5$. (68) Anterior parapodium, $\times 68$. (69) Compound seta, $\times 280$. (70) Posterior parapodium, $\times 45$.

so that its ends meet the intersegmental groove, thus seeming to intercalate a small lens-shaped piece between the two somites.

First parapodium uniramous, with a single lip. Later ones, as far as the fiftieth, also uniramous, but with a trifold apex, having two ante and one post setal lobe (fig. 68). All setæ compound, basal portion deeply incised at end, terminal portion long, curved, with a broad thin "guard" along the convex edge, and a row of minute denticulations at inner edge of "guard" (fig. 69). Dorsal and ventral cirri long in proportion to breadth, rounded at end.

Behind somite 50 parapodium biramous, neuropodium agreeing in all respects with anterior parapodium, while notopodium has only a single anterior and posterior lip (fig. 70). Neuropodium with compound setæ like those in anterior somites; notopodium with long, gently curved simple setæ, with very fine denticulations along convex border.

One incomplete specimen in the collection. Color, dark olive brown; no eyes; about 100 somites; 36 mm. long and 2 mm. broad, not including the setæ.

Collected at station 4081, 202-220 fathoms, on a bottom of gray sand and foraminifera. Type no. 5218, U. S. National Museum.

Family GLYCERIDÆ.

Genus GLYCERA Savigny.

Glycera sagittaria McIntosh.

Glycera sagittaria McIntosh, Report Challenger Exp., vol. XII, p. 347, pl. XLII, fig. 8, pl. XXII A, fig. 10.

One specimen collected at station 4083, 238-253 fathoms, on gray sand. Another, small and very poorly preserved, at station 3823, 78-222 fathoms, on fine sand and pebbles.

Family CIRRATULIDÆ.

Genus CIRRATULUS Lamarck.

Cirratulus zebuensis McIntosh.

Cirratulus zebuensis McIntosh, Report Challenger Expedition, vol. XII, p. 384.

Dorsal bristles smaller and less flattened than ventral and showing a very faint serration toward their bases. Ventral more curved and with serrations along greater part of their length. Hooks absent anteriorly, present in middle and posterior regions. They are long, slender, and only slightly curved.

Collected at Honolulu Reef and from station 3802, in tow net.

Cirratulus capensis Schmarda.

Cirratulus capensis Schmarda, Neue Wirbellose Thiere, I, bd. II, p. 56, taf. xxvii, fig. 213. McIntosh, Report Challenger Expedition, vol. XII, p. 383, pl. xxiv A, figs. 9, 10.

Fragments of much mutilated specimens from Honolulu Reef. In structure of setæ they agree with the above species. It was impossible to determine anything definite about their other characters.

Family TERESELLIDÆ.

Genus TERESELLA Malmgren.

Terebella parvabranchiata, new species.

Three poorly preserved specimens, to which I have given provisionally the above name. Seventeen notopodia. Dorsal setæ broadened and bent at end, apex drawn out into a fine point. Uncinus with one very large tooth, apical portion high, showing in profile as many as 6 smaller teeth (fig. 71). Seen in face view, this apical portion shows a great many small teeth, giving it the appearance of a coarse file.

Tentacles too badly injured for description.

Gills, one pair; each of a central axis with thick, simple, lateral branches, arising alternately on the two sides. Diameter of branches large as compared with the central axis, and their bases arise close together. No trace of eyes could be seen.

Tubes rather thick-walled, of dark brown sand.

Length, 35 mm.; width at anterior end, 4 mm. The possession of but one pair of gills ought perhaps to put these forms in a new genus. They were so poorly preserved, however, that possibly other gills had been lost.

Collected at station 4028, 444-478 fathoms, on bottom of gray sand and globigerina.

Type no. 5219, U. S. National Museum; length, 35 mm.



FIG. 71.—Uncinus of *Terebella parvabranchiata*, new species, × 183.

Terebella (Lanice) flabellum Baird.

Terebella flabellum Baird, Jour. Linn. Soc. London, vol. VIII, p. 157. McIntosh, Report Challenger Expedition, vol. XII, p. 446, pl. XLIX, fig. 3.

A single empty tube from station 3938, 148-163 fathoms, on bottom of white sand and broken shells.

Terebella sp.?

The collection included one fragment of a *Terebella* from Pago Pago, Samoa, too much injured for identification.

Terebella crassifilis Grube.

Terebella crassifilis Grube, Annulata Semperiana, p. 226, pl. XII, fig. 2, 1878.

Some poorly preserved specimens which agree, so far as I can determine, with Grube's description of this species in every respect except in the character of the thoracic uncini. Grube describes these with 4 teeth. In the specimens from Hawaii there are 6.

Collected at station 3834, on coral rock, sand, and shells, and from station 3876, 28 fathoms, on sand and gravel.

***Terebella gracilibranchis* Grube.**

Terebella gracilibranchis Grube, Annulata Semperiana, p. 230, pl. XII, fig. 6, 1878.

These differ from Grube's description in that the tentacles are proportionately somewhat larger, and that the thirteenth ventral scute is much smaller than the twelfth, scutes 13-16 inclusive being very small and easily overlooked. All specimens small. Length to posterior border of twelfth scute 4 mm. Breadth of anterior region 2.5 mm. Body swollen and filled with eggs.

Genus LANICE Malmgren.***Lanice flabellum* Baird.**

Two imperfect specimens. I have identified them from the descriptions and figures of gills, tentacles, and setæ given by McIntosh. (Challenger Report, vol. XII, p. 446, pl. XLIX, fig. 3, pl. I, fig. 1, pl. XXVII A, fig. 22.)

Collected at station 4101, on bottom of coral sand, shells, and foraminifera, in 143 to 122 fathoms.

***Lanice expansa*, new species.**

A single specimen in tube. Tube 3 mm. in diameter, of a membranous base, with fragments of shells, corals, etc., covering entire surface. At apex it broadens into two kidney-shaped expansions, one on either side the opening. Cylindrical portion of tube attached at hilus (fig. 83). Greatest breadth of expansion 10 mm. Length, i. e., diameter parallel to cylindrical portion, 5 mm. Along edge a row of narrow, spiny protrusions having the characteristic membranous base with particles of foreign matter on the surface. Though the body of the animal apparently filled the tube it was found in it in an inverted position, with head pointing toward base of shell. This tube answers well to the description given by McIntosh (Challenger Report, p. 448) for a *Terebella* (*Lanice*) tube, and may be of the same species, though McIntosh found no part of the animal.

Body incomplete, only about 30 somites remaining. Head with dorsally a rather prominent collar, the latter extending on either side to form a prominent lobe, ending in a blunt point. Seen from ventrally, the lobes are fused at base, their edges then overlapping for about half their length, then separate leaving a broad V-shaped space between the two sides. Edge of V not straight but with a blunt elevation about in the middle. Posterior and lateral to the collar is a smaller and less prominent lobe.

Tentacles much coiled and twisted so that number and length are not easy to determine. A groove with elevated, much wrinkled margin runs along one side of each. On either side of this groove a comparatively broad band of pigment. Thorax anteriorly a little narrower than head, widening posteriorly to about same width as head. Ventral shields broadest anteriorly, gradually narrowing to sixth somite, then uniform in size to fourteenth, when they suddenly become larger and much more prominent.

Three pairs of gills, first large, second about half size of first, third about half size of second. Each with a broad portion supporting a much branched apex.

Setigerous somites 17. Setæ long, gently curving to acute tip. Uncini in two rows, each uncinus with base prolonged into an acute point. One large tooth, with two rows of smaller teeth at apex, each row of 2 or 3 teeth. Middle tooth of upper row nearer apex than others, so that side view shows apparently more than 3 rows (fig. 84).

Type no. 5225, U. S. National Museum, collected by the *Albatross* at station 4101, on coral sand, shells, and foraminifera, in 143 to 122 fathoms.

Genus THELEPUS Malmgren.***Thelepus branchiatus*, new species.**

A single much mutilated specimen. Head with no trace of eyes, and bearing long deeply grooved tentacles. Branchiæ in 3 rows. In first row about 8 on a side of long cirrus-like processes, extending considerably beyond head. Those of second row equal to these in size, but fewer in number. Of third row only one, on the left side, was retained. A very small cirrus on the right side probably

corresponds to this. It is altogether probable that the difference in number of branchiæ is due to a loss of some, especially in the second and third rows.

Setæ begin on third somite, and extend through at least 30 somites; are rather short, apex with narrow, very faintly striated wing on either side. Uncini begin on somite 5, and there is only one row in each torus. Uncinus with two smaller hooks apical to large fang (fig. 85). A protrusion on the convex surface gives the uncinus a characteristic "hunch-back" appearance. Basal portion with a small knob.

The body was distended with eggs. Diameter of head, 4 mm.; of thorax, 6 mm. Length of thorax about 15 mm.

Collected at station 4101, on bottom of coral sand, shells, and foraminifera, in 143 to 122 fathoms. Type no. 5226, U. S. National Museum.

Thelepus sp.

A single much mutilated specimen, all tentacles having been lost. Gills finger-shaped processes on second, third, and fourth somites. Those of second longest, about 12 in number. Those on third about equal to these in number, but scarcely more than two-thirds as long. Those on fourth fewer in number, bearing in length about the same proportion to those on somite 3, as do these latter to those on somite 2.

Setæ on thorax slender, with curved ends. A number of irregular serrations, looking like sand deposits, appear on curved portions of setæ. Uncini with short basal portion less than half the length of the great fang, terminated by a small, rounded "button." Great fang long, curved. On either side of apex a smaller fang, about one-sixth length of larger one. Between these small fangs a median elevation, like the basal portion of the fang in shape but without the sharp point.

Collected at station 4551, vicinity of Monterey Bay, California.

Genus AMPHITRITE Müller.

Amphitrite sp.

Fragments of an *Amphitrite*, too much injured for identification, were collected from station 3865, 256-283 fathoms, on a bottom of fine volcanic sand and rock. They were contained in a membranous tube thickly covered on the outside by foraminifera shells.

Genus TERESELLIDES.

Terebellides tentacula, new species.

Length of head and setigerous somites, 9 mm.; width, 1.5 mm. Very considerable differences are, however, to be noted in these measurements, due to different degrees of expansion. The animal lives in a thick mud tube, in which are embedded immense numbers of sponge spicules. Owing to difficulty of penetration, many of the animals inside the tube were very poorly preserved.

Mouth with prominent upper lip, with short tentacle-like processes at outer edge on either side, the number of these not constant.

Median tentacle very long, as long as whole anterior region of body, flat, with edges rolled so as to form a shallow longitudinal groove, much as in tentacle of *Phyllochaetopterus*. Two or three much smaller lateral tentacles on either side.

Gills in a band of 8 finger-shaped processes, on dorsal surface; each gill tapering gently to blunt point at apex; smallest in center of band, largest on outer end. Bases of gills in contact with one another; though there is some indication of a double row arrangement.

Setæ of thorax long, smooth, gently tapering from a broad base to a very delicate point. Two sizes of these setæ appear, but this size difference is possibly due to age differences.

Uncini of thorax in a single row. Teeth 5 in number, increasing in size, beginning at the apex, from 1-4, the fifth being smaller than the first (fig. 72).

Abdominal somites much smaller than thoracic, with uncini like those of thorax.

Collected at station 4126, 278-743 fathoms, on gray sand and foraminifera. Type no. 5220, U. S. National Museum.



FIG. 72.—Uncinus of *Terebellides tentacula*, new species, $\times 280$.

Family MALDANIDÆ.

Genus PRAXILLA Malmgren.

Praxilla sp. ?

From station 3935, at a depth of 35 fathoms, on bottom of white sand, shells, and corallines, were dredged two fragments of the anterior ends of individuals of this genus. In the form of the hooked setæ these resemble *Praxilla kerguelensis* of McIntosh (Challenger Report, vol. XII, p. 405). They lack, however, the anterior collar fold on somites 2 and 3. Tube mainly composed of radiolaria.

Family SABELLIDÆ.

Genus POTAMILLA Malmgren.

Potamilla torelli Malmgren.

Potamilla torelli Malmgren, Nordiska Hafs Annular, p. 402, 1865; Ann. Polychaeta, p. 114, Taf. XIII, fig. 76, 1865; McIntosh, Report Challenger Expedition, vol. XII, p. 484, pl. LIII, fig. 2, pl. XXIX A, figs. 16-19.

McIntosh does not mention paired eyes, which appear on most branchiæ just behind the tip. They are usually very small, but one specimen showed two branchiæ with very prominent eyes, appearing as large, dark-brown, spherical bodies, just behind the apex of the tentacle. The bottle containing the specimen had also a tube, formed of a membranous basis, thickly covered with fragments of shells. It probably belongs with this annelid, though it seemed small for the animal accompanying it.

Collected in Honolulu harbor.

Potamilla elongata, new species.

A number of tubes, 2 mm. in diameter, containing fragments of the animals. Body very long and slender. Gills 20 mm. long, not more than 2 mm. in diameter (when rolled together, as in preserved specimen).



FIG. 73.



FIG. 74.



FIG. 75.

Potamilla elongata, new species. (73) Seta, $\times 280$. (74) Seta, $\times 188$. (75) Uncinus, $\times 250$.

Thoracic setæ of two kinds, one (fig. 73) long, slender, broader at the end, with a terminal acute tip; the other (fig. 74) with shaft about equal to that of former in diameter, tapering to blunt tip, with a rounded "wing" on opposite sides of apex, uniting beyond apex and terminating in an acute tip.

Uncini with one large tooth, and crown covered with a number of smaller teeth (fig. 75).

Collected at station 3865, 256 fathoms, on bottom of fine volcanic sand, and from station 3883, 277 fathoms, on bottom of globigerina ooze.

Type no. 5221, U. S. National Museum, collected at station 3883.

Potamilla californica, new species.

A single individual, retaining only head, thorax, and a few abdominal somites. Branchiæ 20 in number, 6-8 mm. long, with very delicate side branches. Basal portion broadest in collar region, narrowing slightly near where gills are attached. Collar very narrow, with incisions above and below, with ventrally a dark transverse band on either side.

Number of thoracic somites, 8. Setæ and uncini like those of *P. elongata*. It differs from the latter species in the greater body diameter and the much shorter branchiæ.

Collected at station 4551, vicinity of Monterey Bay, California. Type no. 5222, U. S. National Museum.

Genus *LAONOME* Malmgren.*Laonome punctata*, new species.

Body rather stout; thorax 3 mm. in diameter. Length of thorax and abdomen, 21 mm. Tentacles about 10 mm. long.

Tentacles about 25 on a side, basal portion for rather more than one-half their length a deep purple color. Rest of tentacle in irregularly alternating bands of white, yellow, and purple. Inner margin deeply fringed, very short free terminal portion.

Thoracic somites show great variation in arrangement of metameres. Through splitting of somites, the two sides rarely show an equal number of intersegmental constrictions, and consequently have an unequal number of uncinal rows, the number varying from 5-8. Ventral shields of thorax not very prominent, rectangular. A very narrow fecal groove.

Setæ (fig. 76) long, with flattened wing, showing serrated edges. Uncini with one large tooth, and numerous finer teeth scattered over the apex of the crown (fig. 77). Uncini of thorax and of abdomen similar.

Body with numerous minute purple spots scattered irregularly over its entire surface, forming a dense mass just posterior to the collar. Collar narrow, with a prominent incision dorsally and ventrally.

A prominent spot on posterior ventral face of each parapodium.

The animal lives in a thick-walled tube, covered on the outside with a layer of brown mud.

Collected at Puata Bay and at Waialea, Oahu. Type no. 5223, U. S. National Museum. Length of thorax and abdomen, about 21 mm.; collected at Waialea, Oahu.

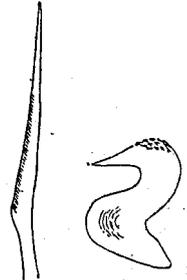


Fig. 76. Fig. 77.
Laonome punctata, new species. (76) Seta, $\times 280$. (77) Uncinus, $\times 280$.

Family SERPULIDÆ.

Genus *POMATOCERUS* Phillipi.*Pomatocerus strigiceps* Mörch.

Pomatocerus strigiceps Mörch, Naturhistorik Tidsskrift, Kjøbenhavn, June, 1863, p. 412. McIntosh, Report Challenger Expedition, v. XII, p. 520; pl. LV, figs. 3, 4; pl. XXI A, figs. 26, 27, 28.

Two specimens, somewhat broader than those described by McIntosh, being nearly 6 mm. wide in the region of the collar. Each had lost its operculum, the only trace remaining being a short piece of the thick, cylindrical stalk.

Collected at stations 4031 and 4034, 14-28 fathoms, on fine coral sand, foraminifera, corals.

Genus *PROTULA* Risso.*Protula arafurensis*? McIntosh.

Protula arafurensis McIntosh, Report Challenger Exp., vol. XII, p. 511, pl. xxxi A, figs. 17, 18.

Two specimens. Both were injured, neither retaining any portion of the abdominal region. McIntosh's specimen had lost the branchiæ, but in character of thoracic membrane and in setæ these agree with his description. Branchiæ 36-40 on a side, rising from a broad base, tightly coiled. No appreciable extent of apex devoid of lateral branches. Length of thorax of larger specimen 7 mm., of gills (contracted) 7 mm.

Fragments of calcareous tubes were found in the bottle with the specimens. It is doubtful whether they really belonged to the animal.

Collected at station 4551, in vicinity of Monterey Bay, California.

Genus *VERMILIA* Lamarck.*Vermilia* sp.

A single shell, containing only a few fragments of the animal, too much injured for identification. Collected at station 3916, 299-330 fathoms, on bottom of gray sand and mud.

Family HERMELLIDÆ.

Genus *HEMELLA*.*Hermella varians* Treadwell.

Hermella varians Treadwell, Polychaetous Annelids of Porto Rico, Bull. U. S. Fish Commission, vol. xx, 1900, p. 210, fig. 81.

These had a few less paleæ on either side than did the specimens from Porto Rico, and the inner row of paleæ was more often three than four on a side. The two large tentacles were easily broken, so that few individuals showed both intact. When one was gone, the other looked like a single median tentacle. Behind the tentacle on either side is a row of 3 or 4 tentacle-like processes, extending partly around the body.

Collected at station 3909, 308-322 fathoms, on a bottom of fine white sand and mud.

Genus *SABELLARIA* Lamarck.*Sabellaria setosa*, new species.

Head truncated only in a very slightly oblique fashion, with shallow fissure dorsally and deeper one ventrally. On either side a single row of about 15 very slender paleæ, continued around a curve near ventral surface so as to form nearly a complete circle. First 2 or 3 dorsal ones short, others much longer, of uniform length throughout. Paleæ slender, tapering uniformly to apex, with what appear under low power to be very minute denticulations along both sides. Under high power (fig. 78) this appearance is seen to be due to a series of rings, the outer edge of each forming a protrusion all around the palea. These rings relatively more prominent toward apex. Interior of paleæ with numerous fine parallel longitudinal lines.

Dorsally at end of row of paleæ is on either side a row of about 6 short hooks. Each (fig. 79) has a thick central axis, curved at apex, and with a broad, thin wing on curved surface. Axial portion marked with large numbers of fine longitudinal lines.

On outer side of head near bases of paleæ is on either side a row of slender, finger-shaped cirri. These may differ in size, apparently a result of unequal contraction. Dorsally each row bends around so that a few cirri are found between the two rows of dorsal hooks.

Mouth with two large palps, crenulated at the edges. Behind these on either side a broad, rounded lobe. Behind this two transverse rows of cirri, 2 or 3 in a row, the anterior larger than the posterior, most dorsally placed cirrus of posterior row lying close to base of first gill. A narrow, rounded, and rather prominent lower lip lies just posterior to the mouth.

Gills eight pairs, long, narrow, gently tapering toward apex, the anterior ones largest and overlapping in dorsal middle line, posterior ones smaller. Along both edges of each gill are series of little fleshy protrusions of its wall.

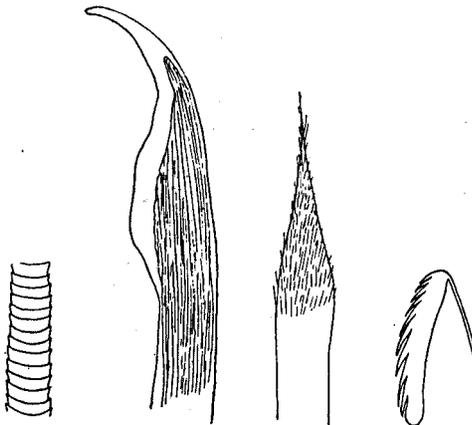


FIG. 78. FIG. 79. FIG. 80. FIG. 81.
Sabellaria setosa, new species. (78) Portion of palea, $\times 183$.
(79) Dorsal hook, $\times 45$. (80) Seta, $\times 185$. (81) Uncinus,
 $\times 280$.

Somites 2 to 5 carry dorsally a row of short, stout setæ with broad pointed ends (fig 80). Whole surface of expansion covered with short, sharp spines. Alternating with these in each row are very long, delicate hair-like setæ. On sixth somite these setæ disappear and a row of uncini takes their place. Each uncinus with numerous sharp spines along one face, looking in profile (fig. 81) like a single row of very sharp spines. Some show a rod attached at one end as in figure, while in others it is attached at the opposite end. I am unable to say whether there is any regularity in the distribution of these two forms. These rows of uncini are found in as many somites as were preserved in any of my specimens. Ventrally in each somite is a tuft of very long, hair-like setæ.

The posterior body region was not preserved in any of the specimens.

Tube very thick walled, composed almost entirely of shells of foraminifera.

Length of head and 12 anterior somites 16 mm. Width of anterior region 3.5 mm. Color (in alcohol) light brown ventrally, dark brown dorsally. Palps and cirri of head very light brown. Paleæ golden yellow. Collected at station 4041, 382-253 fathoms, on bottom of gray mud and foraminifera. Type no. 5224, U. S. National Museum.